

Timber Supply: Mississippi and the South

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Introduction

The availability of timber has become an issue across the South as supplies from other regions are constrained and as demand for timber continues to grow. While any individual state or landowner will have a small impact on national timber supplies, the availability of local timber will have a profound effect on local industries. In Mississippi, for example, furniture manufacturing requires large-diameter hardwoods and when not available locally, this industry must find alternative sources of timber, alter production to reduce wood requirements, or, in the worst case, it will not be able to compete nationally. Thus, while the demanders of timber compete in national and international markets, supply issues are generally local and regional. In this paper, we discuss the implications of increased demands on regional prices and sub-regional timber availability. Using the Sub-regional Timber Supply model

(SERTS), harvest, inventory and growth trends are developed for both non-industrial and forest industry owners for sub-state regions across the South.

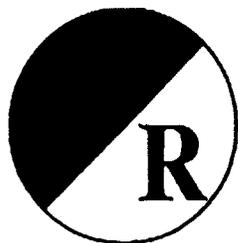
Although the South contains only 40 percent of the nation's timberland area, this region produces 53 percent of our softwood harvest and 60 percent of the hardwood harvest. National level

with only 10 percent of the South's timberland, but 12 and 15 percent of Southern softwood and hardwood timber removals. The price increases in the South will affect timber removals in all areas of the South, but based on current harvest, growth and inventory, will cause shifts in harvest between sub-regions.

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analyses project increases in Southern timber harvests, with corresponding price increases, over the next 40 years. Mississippi also contributes to the South-wide harvest in greater proportion than it contributes to timberland,

Because over 75 percent of Mississippi's removals come from nonindustrial private lands, these lands can have significant effects on total local timber supply. While factors such as
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urbanization, environmental protection and site constraints will affect all landowners, non-industrial private forest (NIPF) landowners often have objectives which conflict with maximum timber production. A 1996 study revealed that nontimber objectives were the dominant reasons given by landowners for owning timberland. Many of these landowners have small acreage, however, because over 60 percent of Southern timberland was owned by individuals who had timber production as the primary or secondary ownership objective.

Increases in local timber demand are projected to occur because of national increases in demand for wood products, such as paper, lumber and structural panels. National-level projections developed by the USDA Forest Service for the Resources Planning Act Assessment (RPA) projected increases of eight percent in national lumber demand, nine percent in wood pulp, and 33 percent in structural panels between 1991 and 2010, with most of the

lumber and pulp increases coming from the South. The analysis that follows assumes regional harvest rates are as projected in the RPA Assessment, and assumes plantation growth per acre increases by 30 percent by 2020. The model results show changes by Mississippi subregion for harvest and inventory up to 2020.

Timber Markets in the South

Before getting into projections and where timber markets in the South seem to be headed, it is worth spending some time looking at historical price and inventory trends. Regional inventories have been increasing at least since the 1930s, when the USDA Forest Service began estimating inventories, up until the most recent surveys. At the present time, softwood inventories are declining in some areas, resulting from removals exceeding growth. Hardwood inventories are leveling off, largely as a result of increased harvest in nearly all areas of the Southern timber market.

Prices for the South tend to move together, with products (i.e., pulpwood, sawtimber) showing more cohesion than species (hardwood, softwood), with both species of sawtimber exhibiting a market shift in about 1991. Pulpwood prices for the region show a general pattern of moderate increases before 1988 and rapid increases and more volatile prices after 1988. Note, however, that softwood pulpwood prices were much higher than hardwood prices before 1988. In many areas these prices are now the same.

Economic Model—Sub-regional Timber Supply

Although inventory is highly influential in determining levels of supply, standing timber inventory is not the same thing as supply. Supply is what landowners willingly provide to buyers at certain prices. Inventory is one of the factors that will shift supply, as are factors such as regulations and landowner objectives. By using an economic model which includes elasticities (calculated responses in supply to a

Southwide Private Softwood Inventory
SERTS - Based on RPA trends

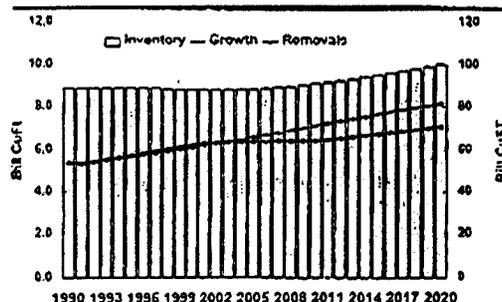


Figure 1.

change in a single factor), we can approximate the influence of current regulations and objectives. The model projects harvest and inventory trends for the 51 Southern survey units and for NIPF and industrial owners. (Survey units are designated by the USDA Forest Service Forest Inventory and Analysis [FIA] and roughly correspond to physiographic region.)

SERTS uses changes in aggregate inventory to shift the supply curve; for example, an increase in inventory will shift supply outward. Using the demand scenario from the RPA Assessment, price changes can be calculated for

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softwood and hardwood growing stock. A model to examine individual products is currently being developed at North Carolina State University. These price changes are assumed to apply to all subregions. With the price change and by calculating an inventory change for each subregion, a new harvest level can be calculated for all survey units and owners. This subregional harvest then affects inventory and growth, which will influence aggregate inventory and cause further shifts in the supply curve. This process will continue until harvest shifts to equalize price pressure and an equilibrium is reached. The results of the model must be viewed within the context of overall economic conditions, which could include significant technology changes, possibly leading to substi-

year. Plantation definitions have been expanded to include all forest types that have been planted. Often a young plantation is typed as a hardwood stand because hardwood stems may dominate the planted pine. Based on conversations with FIA, we are using all planted acres to represent pine plantations in an effort to eliminate undercounting. These runs also base growth on new growth regressions developed specifically for each owner and subregion. This allows for more consistent growth than would be achieved using either FIA averages or growth/yield model output. Finally, growth on pine plantations is assumed to increase 30 percent by 2020 based on intense silvicultural techniques.

Southwide Private Hardwood Inventory
SERTS - Based on RPA trends

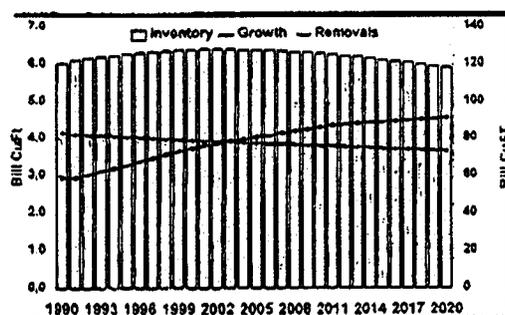


Figure 2.

tutions away from timber, or changes in global markets affecting demand for Southern fiber.

Timber supply depends on price and inventory, while timber demand depends on price and demand shifters such as population and housing starts. It is the interaction of these two forces that results in the market outcomes of prices and harvest. The model uses RPA Assessment harvest assumptions for the South as a whole, and also uses the Southern acreage projections by forest type. Pine plantation acreage is projected to increase while hardwood acres fall slightly, resulting in fairly level total timberland acreage. These nationwide trends were applied to all subregions and owners.

These runs use the most recent Florida and Arkansas surveys, but none of the states are updated to a single base

Model Results

Across the South:

The model results discussed here are preliminary because of the many recent changes to the model and data. These latest runs indicate that the Southern private softwood inventory will begin to recover over the next decade, although this result is highly influenced by the assumed growth rate (figure 1). Hardwood inventory, across the

South, is shown in figure 2, and is projected to rise through the early years of the next century, then decline slowly as removals exceed growth for the first time in about 2000.

Softwood harvests appear to be shifting out of the center of the region into the 'fringe' subregions of Tennessee, Arkansas and coastal Virginia and North Carolina. There is also a significant shift to plantations on the coastal plain. Hardwood harvests follow similar patterns in moving to Arkansas and Tennessee, but are also moving out of coastal areas and into the hardwood-rich areas of the Piedmont.

Mississippi Private Softwood Inventory
SERTS - Based on RPA trends

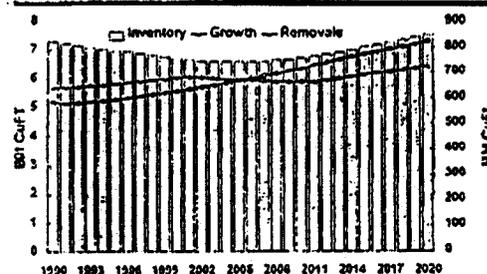


Figure 3.

Mississippi:

Total private softwood inventory, including both NIPF and industry volumes, declines from 1990 to 2005, then increases until, by the end of the projection period, the inventory is actually higher than in 1990 (figure 3). Because of the high removals relative to the South, Mississippi removals, which currently exceed growth, increase slowly or even decrease. Along with the increases in growth and acreage associated with plantations, this allows the softwood inventory to recover. Both the decline and subsequent rise are steeper than in the south-wide runs. As shown in the following two figures, the decline is in NIPF inventories, with most of the increase coming from industry lands.

By subregion, the North and Central survey units show similar trends to the state. In the South subregion, inventory rises over the projection period, and growth continues to exceed removals. The Southwest subregion has declining softwood inventory, with removals declining and finally falling below growth in 2010. Figure 4 shows soft-

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Mississippi's trends in softwood harvest and inventory are projected to mirror the South-wide trends.

Mississippi hardwood inventory is falling throughout the projection period. This implies that Mississippi has a relative disadvantage in hardwood production, and will continue to see increases in hardwood harvests, but these rates will be below the regional average as harvest shifts to the northern reaches of the Southern region.

Note that these scenarios are based on an assumption of increased regional harvest. Other model runs which hold current harvest constant imply that the region can sustain the harvest levels estimated in the last round of FIA surveys. Examination of severance tax data in several states, however, indicates that current removals may be 20 to 30 percent higher than the latest FIA estimates. Long-term increases in real prices are relatively rare. If these trends continue, there is likely to be a significant economic response on both the supply side (intensive management) and the demand side (better utilization, substitutes). The model results indicate, however, that these adjustments will be necessary if the South is to supply the expected increase in demand.



Timber Supply
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wood inventories by subregion over the projection period.

Private hardwood inventories show vastly different trends from softwoods, falling from a high in 1990 to a low at the end of the projection period (figure 5). Most of the inventory, and consequent removals and growth, occur on NIPF lands. Removals exceed growth for most of the period on both ownerships. All of the subregions have significant hardwood inventories, and all inventories decline over the projection period. In both the Delta and South subregions, hardwood removals are less than growth at the beginning of the projecting, but by the late 1990's, harvest exceeds

Mississippi Private Hardwood Inventory SERTS - Based on RPA trends

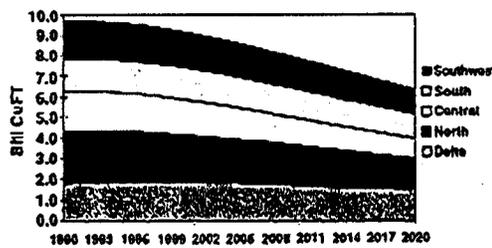


Figure 5.

hardwood growth in all five subregions in Mississippi. This results in the declining inventories shown for all subregions.

Conclusion

Mississippi's trends in softwood harvest and inventory are projected to mirror the South-wide trends. Inventory declines at first, then recovers. This results in price increases for softwoods in the middle years of the projection, but these increases slow considerably by 2020. In hardwoods, Mississippi shows a different pattern from the overall South. Where total Southern hardwood inventory is rising until about the middle of the projection,

Mississippi Private Softwood Inventory SERTS - Based on RPA trends



Figure 4.