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 (continued on next page)
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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 maxi-
mum timber production. A 1996 study
revealed that nontimber objectives were
the dominant reasons given by land-
owners 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 Assess-
ment (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 Assess-
ment, and assumes plantation
growth per acre increases by 30
percent by 2020. The model
results show changes by Missis-
sippi 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
1950s, 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 invento-
ries 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., pulpwod,
swawtimber) 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, how-
ever, that softwood pulpwod 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 influen-
tial 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 land-
owner objectives. By using an economic
model which includes elasticities (calculated responses in supply to a

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 substitutions 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 shifts such as population and housing starts. It is the intersection 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 regionwide 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 year. Plantation definitions have been expanded to include all forest types that have been planted. Often a year 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.

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:

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 that 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.

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,