Southern Forest Markets: 
Pellets and Forest Carbon

Bob Abt
Karen Abt *USDA Forest Service*
Jesse Henderson
Bruno Kanieski da Silva
In a privately owned timberland market, how does increased demand for wood affect forest inventory and forest carbon?
Forested Inventory/Carbon Stock Increasing

Merchantable Volume

- Hardwood
- Softwood
- Planted

Soil
Tree
Dead, litter, understory
Carbon Stock

Carbon Sequestration

Annual Growth by Forest Type
Timberland Area Steady but not Static
Southern Timberland is Dynamic Because:

- This is a privately owned largely un-regulated landscape where marginal agriculture competes with forest land both at the intensive (plantations) and the extensive (fallow agriculture) margins.

- “…we identified the rise in timber net returns as the most important factor driving the increase in forest areas between 1982 and 1997. This is consistent with reports that the increase in forests largely involved timberland acreage.” (Lubowski et al. 2008)

- What does this mean for the carbon consequences of increased demand for pellets?
Returns to Forestland and Pellets

• Pine Sawtimber (PST) has been the primary rent driver on southern timberlands

• Low value products like pulpwood, not so much.

• This matters for pellets. If demand/harvest for pulpwood (e.g. pellet feedstock) doesn’t influence returns to landowners and improve opportunities for forest management – the forest carbon benefit is reduced.
For Pellets to Influence Returns

• The PST / PPW price differential needs to decrease

• Pellets need to be a significant share of the market (large enough to influence prices)

• Note: this is a local story, markets vary widely across the South.
Pine Sawtimber Prices Decline
Relative to Everything

Forest2Market Pine Southwide Annual Average

PST/PPW

$25

Forest2Market Hardwood Southwide Annual Average

$23
Pine Sawtimber Prices Decline Relative to Everything

PST/PPW

PPW price becomes more important

$25
Side Note – Why haven’t PST prices recovered and when will they?

Demand is UP:
2017 SYP Lumber Production > Pre-Recession Peak

Lumber Production Differs From Stumpage Consumed
• Efficiency Change
• Data Sources
But Supply is further UP

Pine non-Sawtimber Inventory on Plantations

Pine Sawtimber Inventory on Plantations

2011-2015 avg increase = 11%

2011-2015 avg increase = 28%
Why? Tree Planting Cycles in the South

We planted a lot of trees 30 yrs ago.

High PST harvest and replanting today sets up the next 30yr cycle.
Pulpmill Consumption Trends: How does sawmill production affect pellets?

Pulpmills switch to roundwood when mill residues disappear. Pulpmills and pellet mills compete for sawmill residue.
Do they have significant market share?

PELLET PRODUCTION
Southern Pellet Mill GreenTon Consumption (Forisk)
Small Proportion but Changes Trend

Pulpmill Rwd + Energy Consumption

- PINE PULPWOOD
- PINE ENERGY
- HWD PULPWOOD
- HWD ENERGY


0, 1, 2, 3, 4

Millions

TPO
MCF
Pine PULPWOOD and Other (includes pellets/energy)

Pine Pulpwood

Pine Other (includes pellets)
Hardwood PULPWOOD and Other (includes pellets/energy)
2015 TPO Wood Consumption
Pellet/Energy % of Pulpwood by State
We Have Not Reached Peak Pellets: Recently Added or Announced Capacity
NC and GA pulpwood prices before and after pellets

Southwide Sawtimber Price = $25 and declining

Pellet Mills
Open in 2011
Pellet Demand and Pine Pulpwood Prices

A

Pellet mills capacity (Softwood) - PMI - PMNI

Price

Pellet Capacity

B

Pellet Mill - Capacity (Softwood and Mixed)

Capacity (Thousands tons)

0 700 1500

03/27/2019

BRDI DC
Pellet Demand and Pine Pulpwood Prices

- Pellet mills capacity (Softwood) vs. PMI vs. PMNI
- Price vs. Capacity (million tons)
- Pellet Capacity

Large enough to affect prices
When pellets can drive local forest returns:

HOW DOES PELLET DEMAND AFFECT FOREST CARBON?
SRTS Model Results:

*In the current market, increasing demand for small value trees has more land rent impact than it has historically.*

**Total Forest Carbon Can Actually Increase. But timing matters.**

Rent affects area in forest and distribution of forest types.

**Note: This is not the same as “carbon neutral”**
Market and Resource Summary

*In an open land market:*

Increased forest product demand leads to:

- Higher prices
- Land use and management response (HPW)
- Net inventory/carbon response depends on local markets (shifts, substitutions, expansion)

**Note: Agriculture markets matter too**

- high prices reduces area of fallow ag land (and reduces CRP land remaining in forest). Ag technical change can reduce demand for land.
Market and Resource Summary

Bob’s Opinion

When the pellet industry was beginning, there was a lot of PR about how it would not compete for wood or affect markets. It would only be using harvest or mill residues. In fact, several articles commented on how pellets could not possibly compete with pulpmills for the same resource.

Turns out you can’t build a significant biomass industry without affecting markets. Which is a good thing at least in the US South. Because the extent and management of private forests and forest carbon are market driven.
Questions?

bobabt@ncsu.edu