

Forest Resources and Markets in the South

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NC STATE EXTENSION



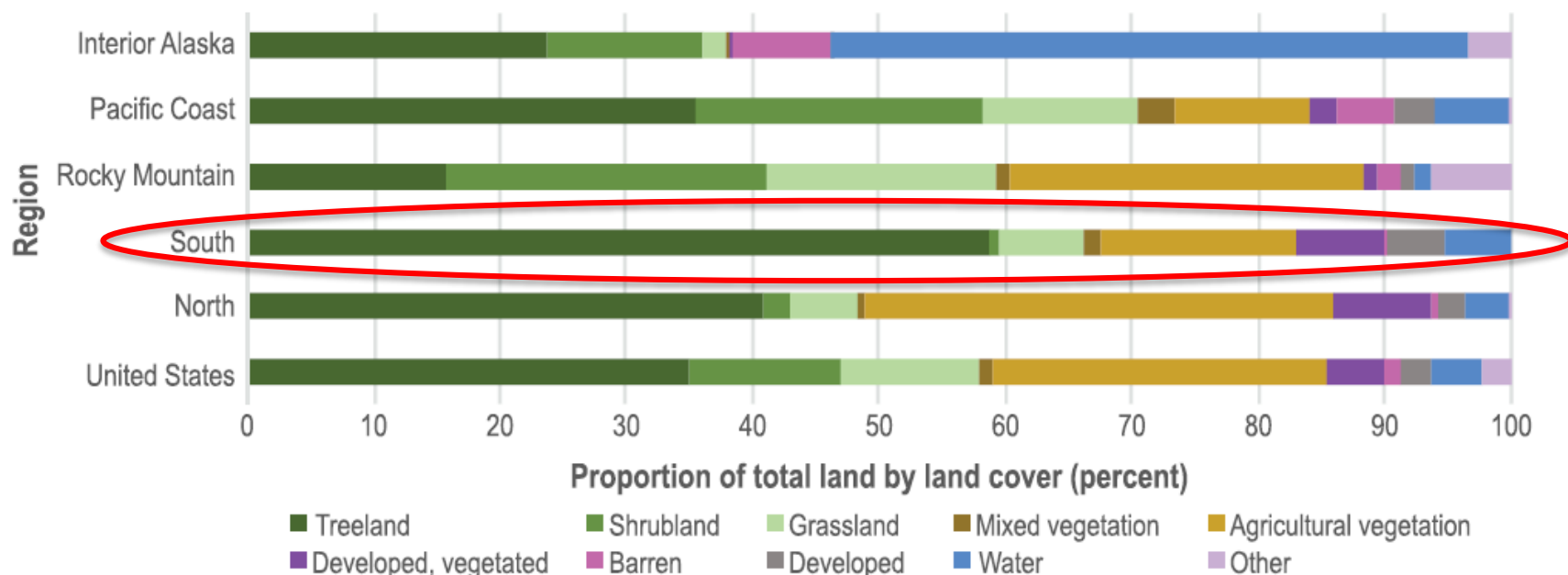
Outline

- Forest resources in the U.S. South
- Timber use trends
- Industrial wood pellets
- Southern timber market outlook



Forest resources in the South

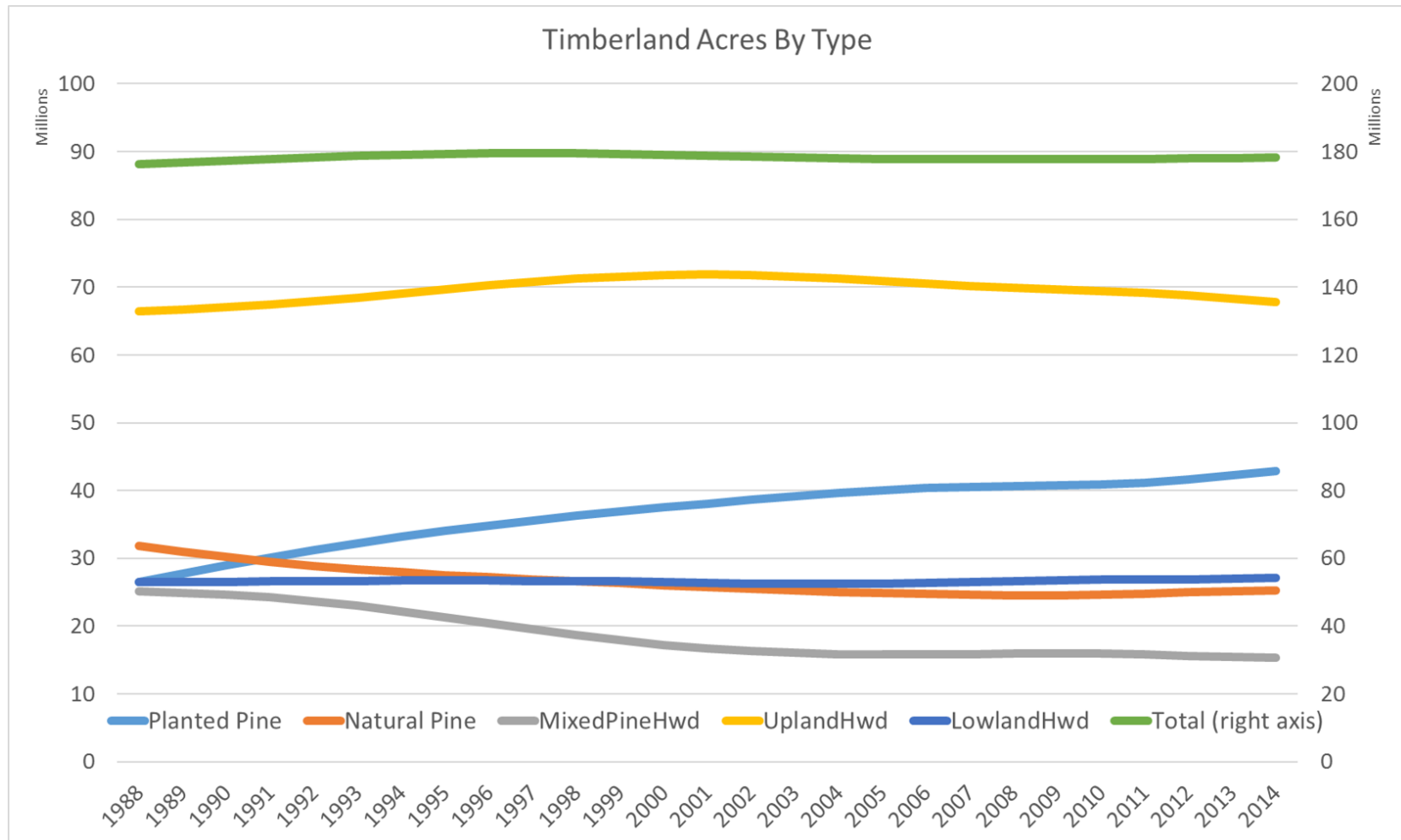
Total Forestland: 245.5 million acres-- 46% of the total land---32% of total U.S. forestland



Note: Nonvascular vegetation comprises less than 1 percent of U.S. land area and is omitted from the figure.



Timberland area steady but not static



Source: FIA

Forest ownership in the South

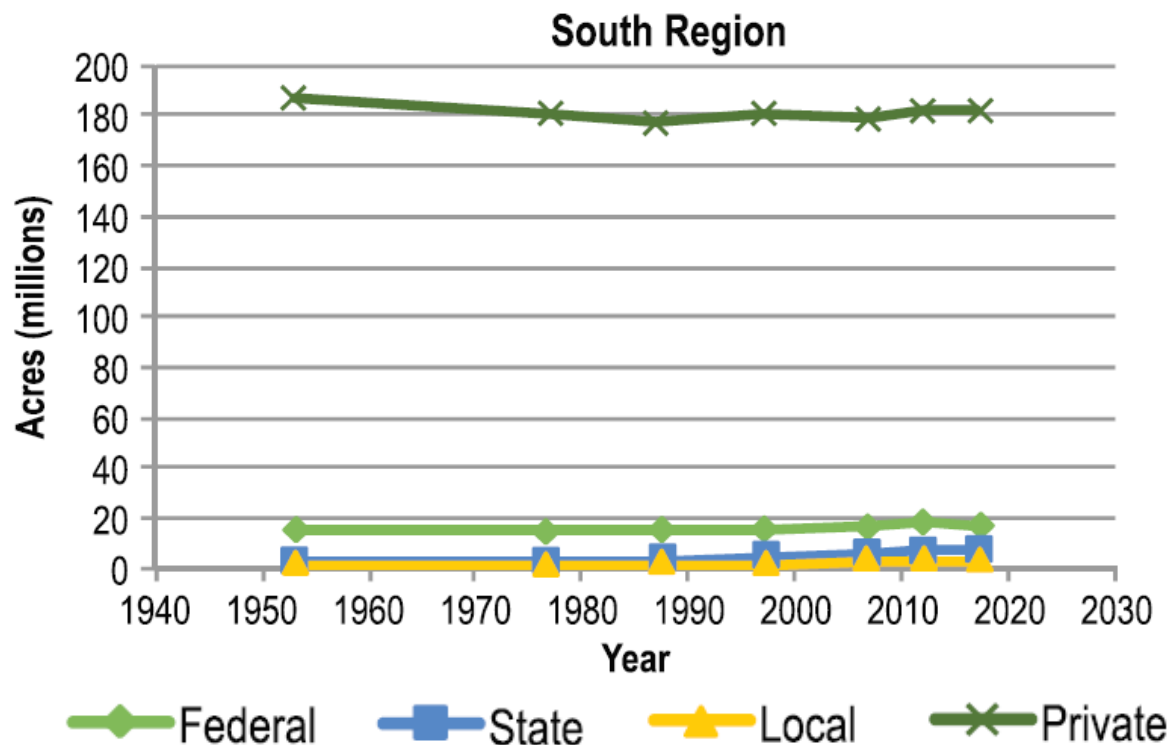
Public: 14%

Private corporate: 28%

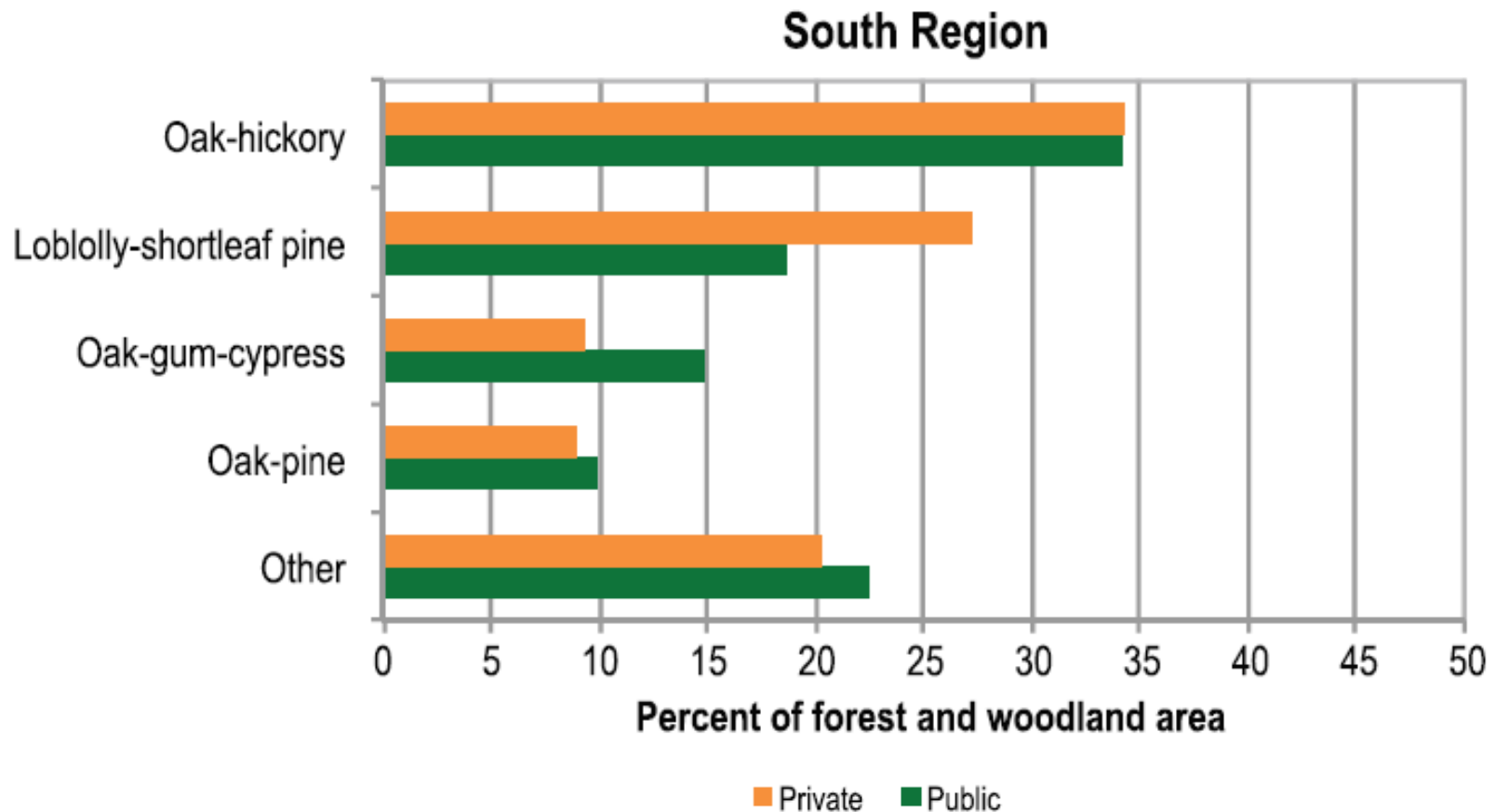
Private non-corporate: 58%



**A privately
owned
largely un-
regulated
landscape**

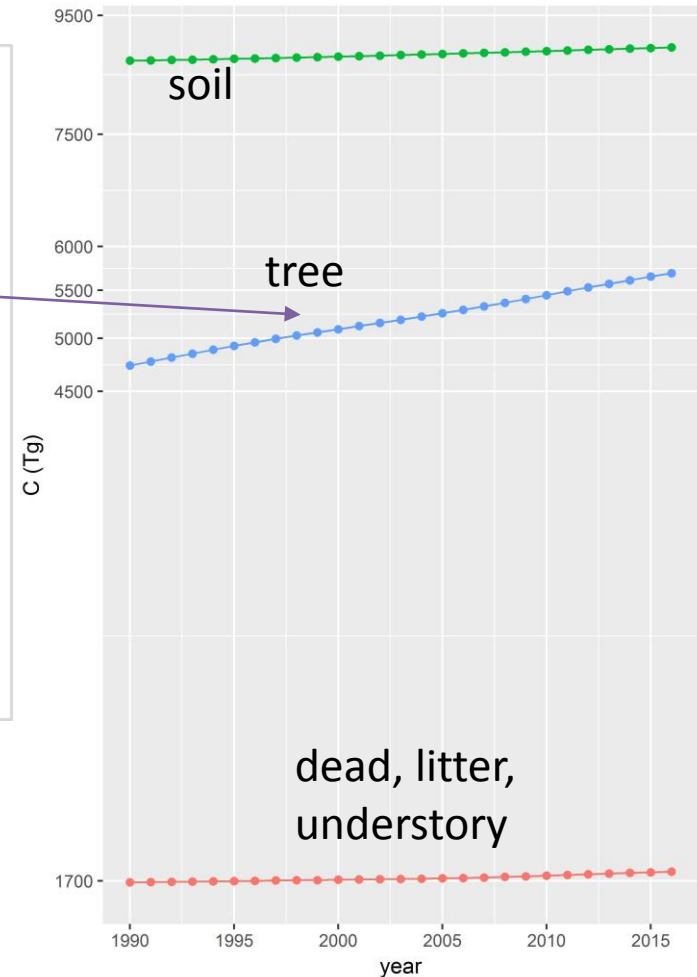
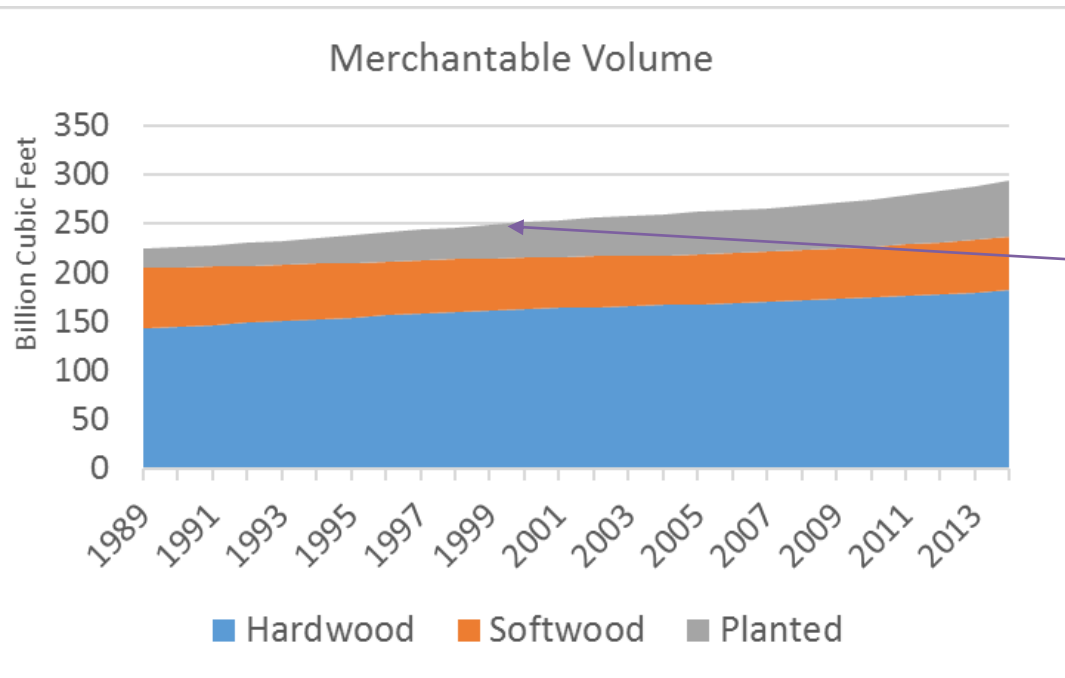


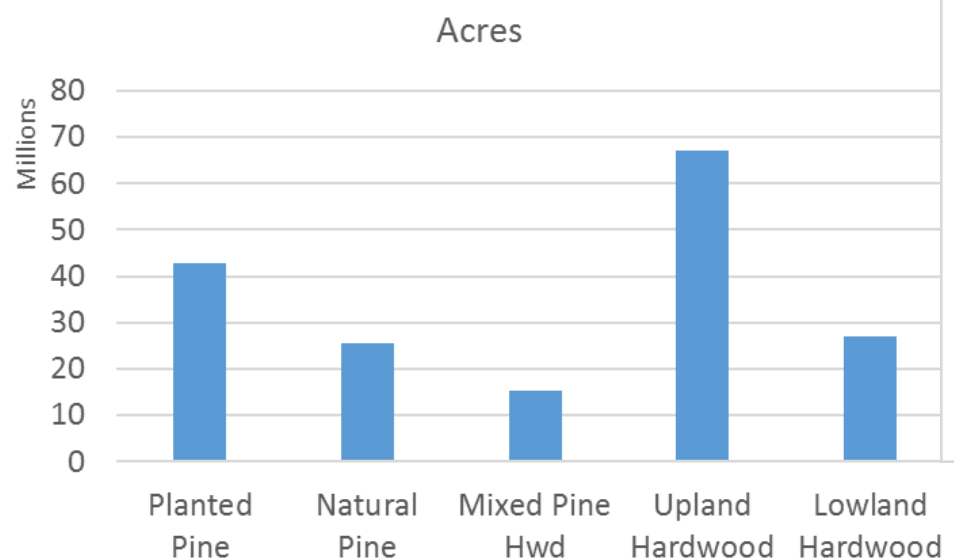
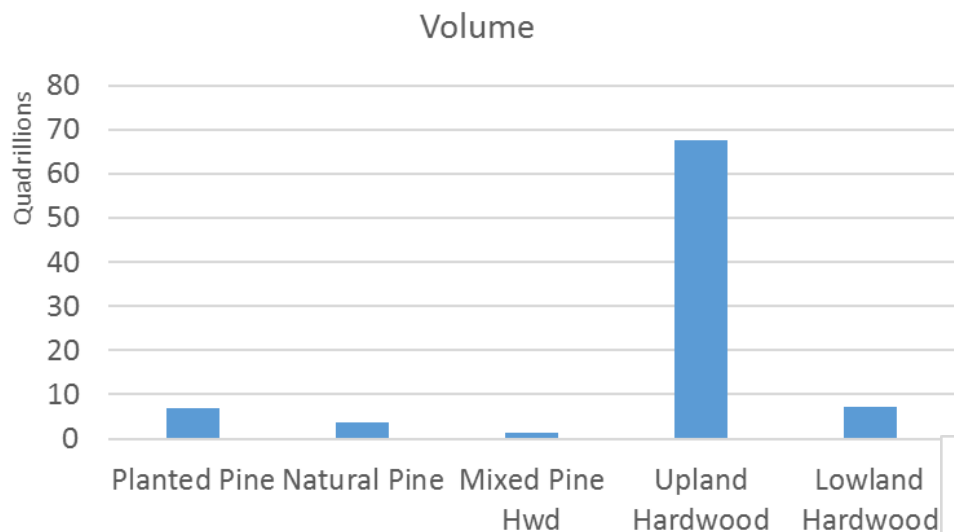
Forest-type groups by ownership



More hardwood: 55%

Southwide forest inventory/carbon stock increasing

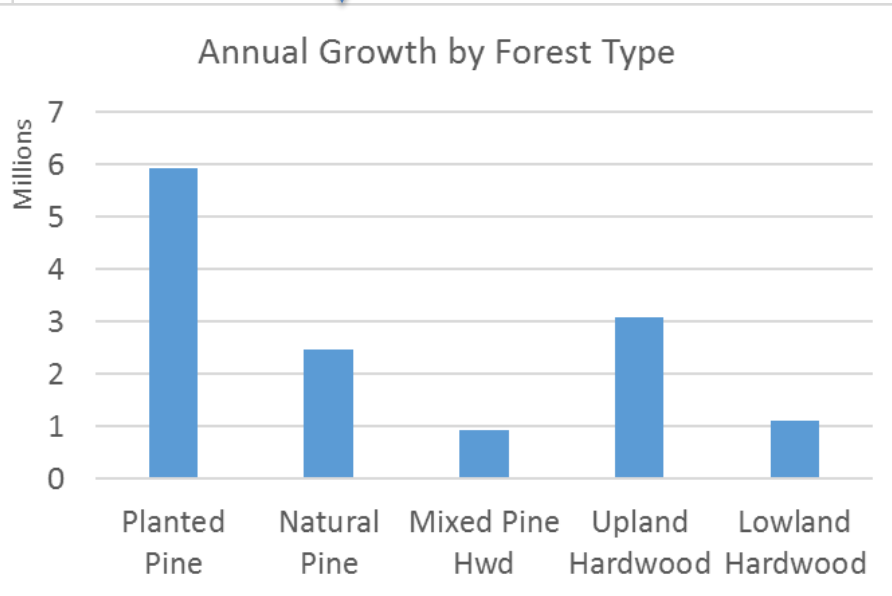




In the southern forest, where's the carbon stock and where's the sequestration?

Carbon Stock

Carbon Sequestration



Source: Abt, SOFAC

Fully-grown trees dominate

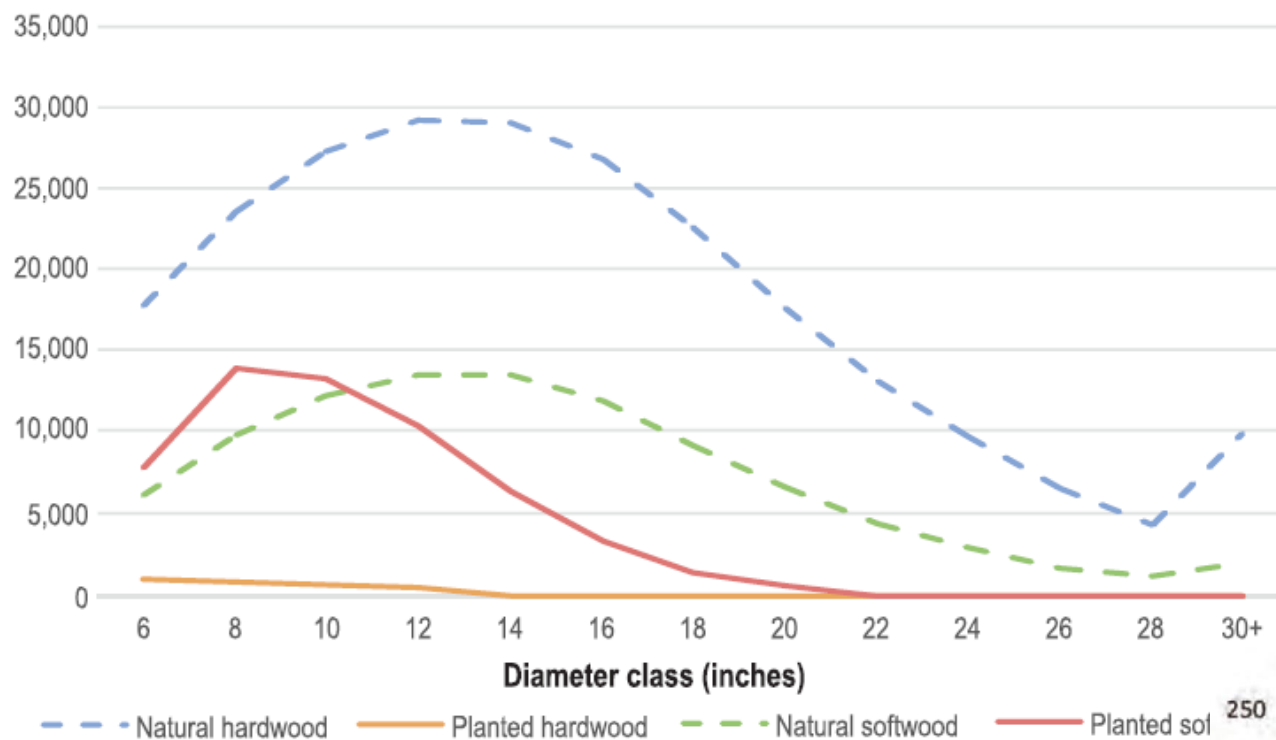
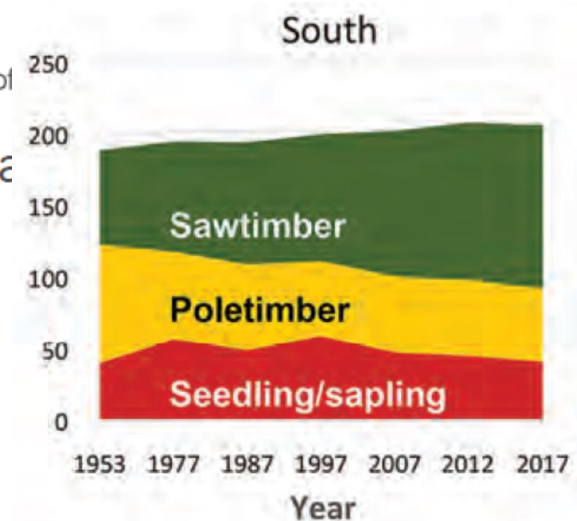


Figure 5-3. Volume of all-live trees on southern forest lands by major species group and stand origin, 2017.



Annual growth is higher than harvests

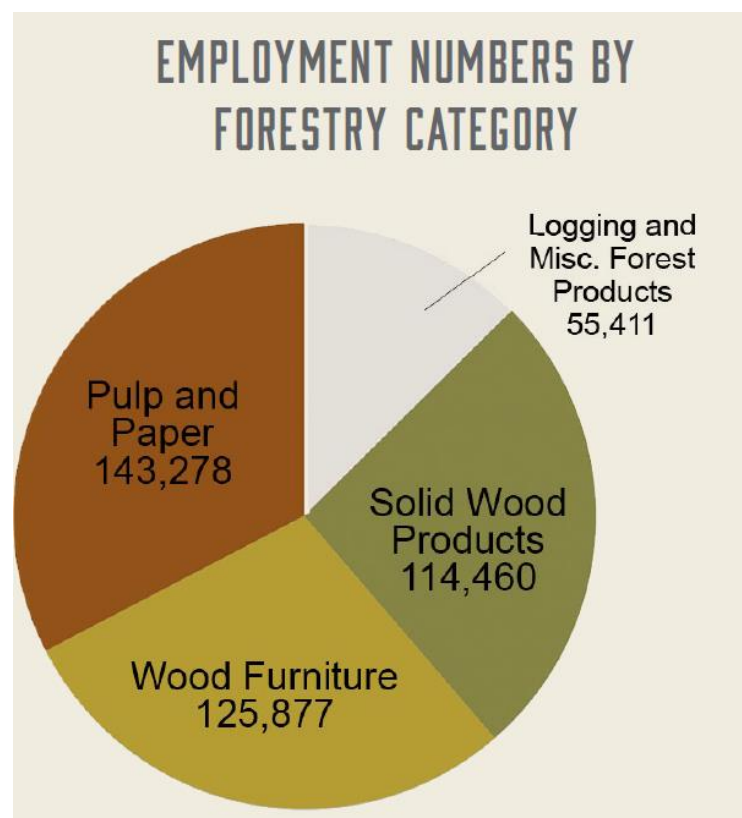
Growth to drain ratio:

	Softwoods	Hardwoods	Total
Average annual net growth volume (billion cu ft)	9.71	4.71	14.43
Average annual removals (million cu ft)	6.14	2.52	8.66
Growth to Drain Ratio	1.58	1.87	1.67

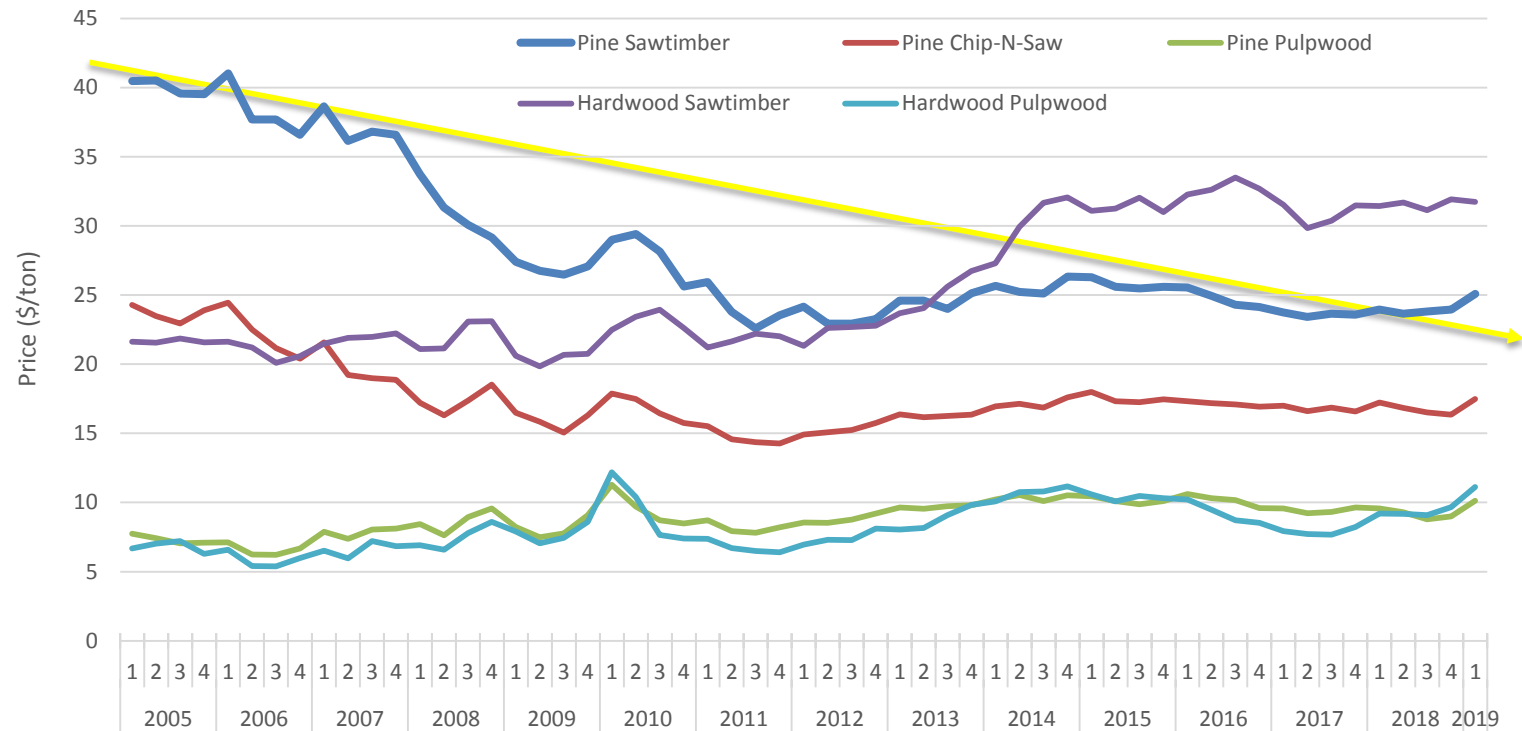
Annual harvest is less than annual growth

The economic importance of forestry in the South

Forestry and the forest products industry generated **\$230.6 BILLION**, or over **2%** of U.S. South regional economic output. Forest-related economic activity generated **1,075,764 JOBS** and **\$47.9 BILLION** in income in 2011, about **2% OF ALL JOBS** in the South.



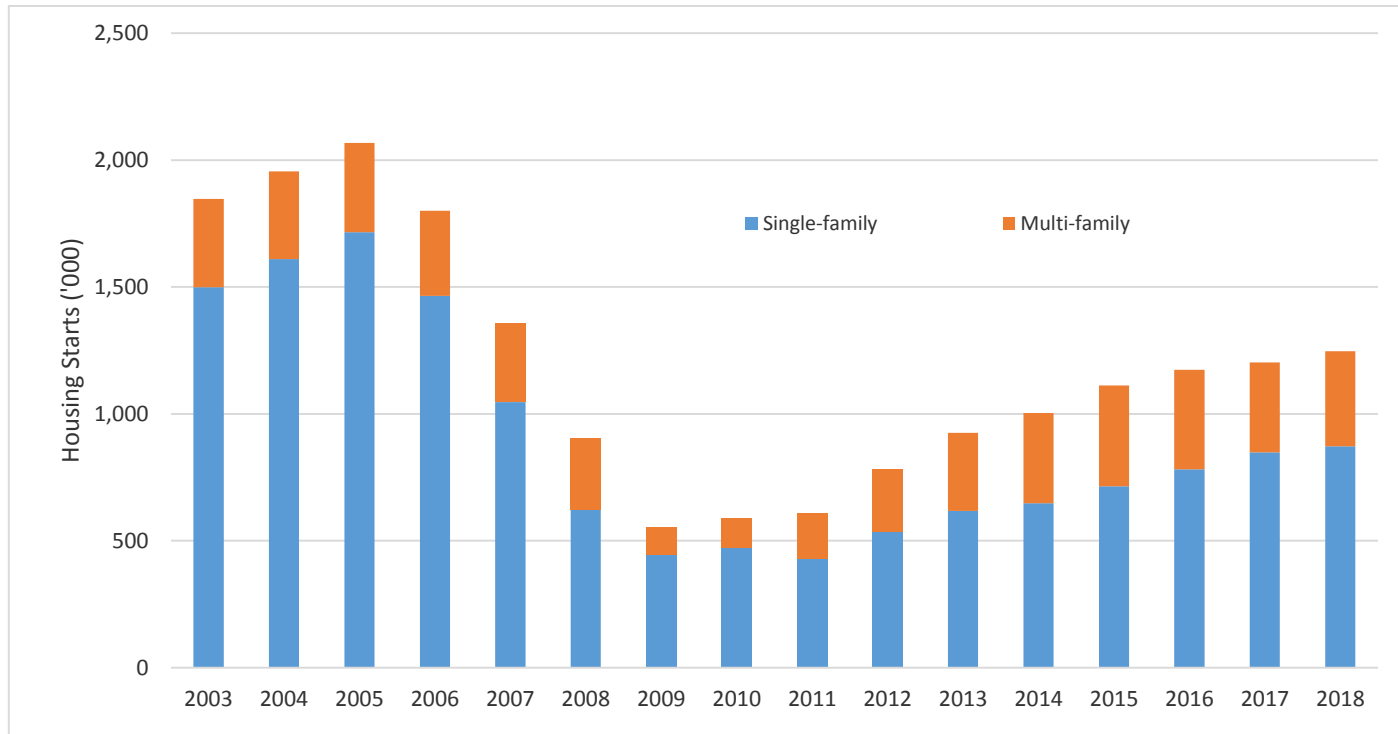
Timber Markets in the U.S. South



South-Wide Regional Timber Price Trends, 2005-2019 (Timber-Mart South 2019)

Pine sawtimber prices have dropped almost 40%

U.S. Housing Market

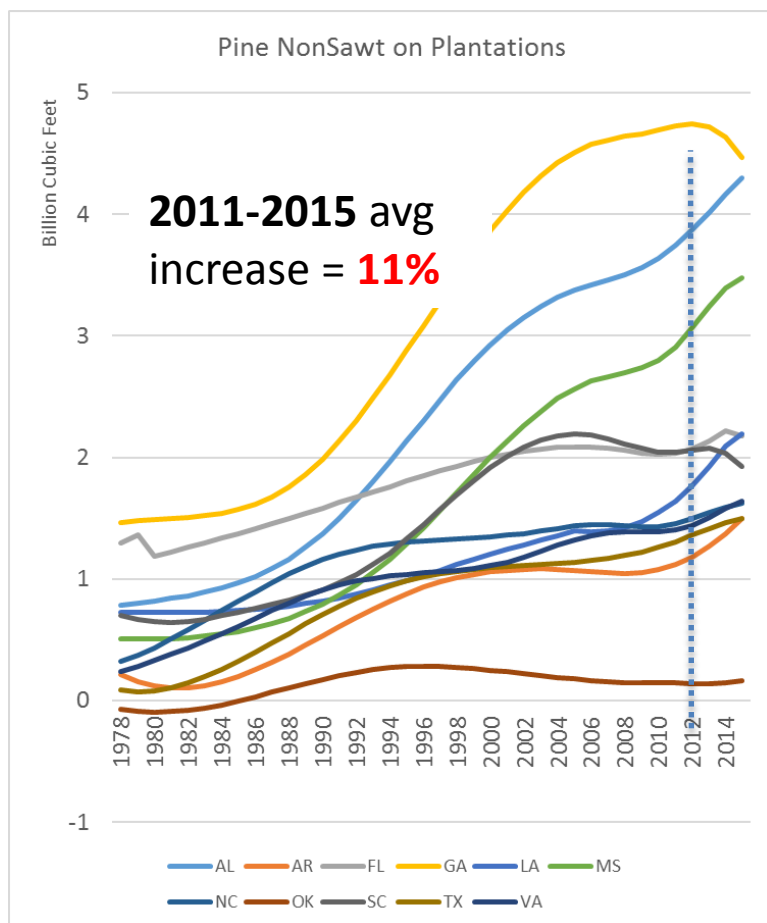


75% of structural wood products go to housing

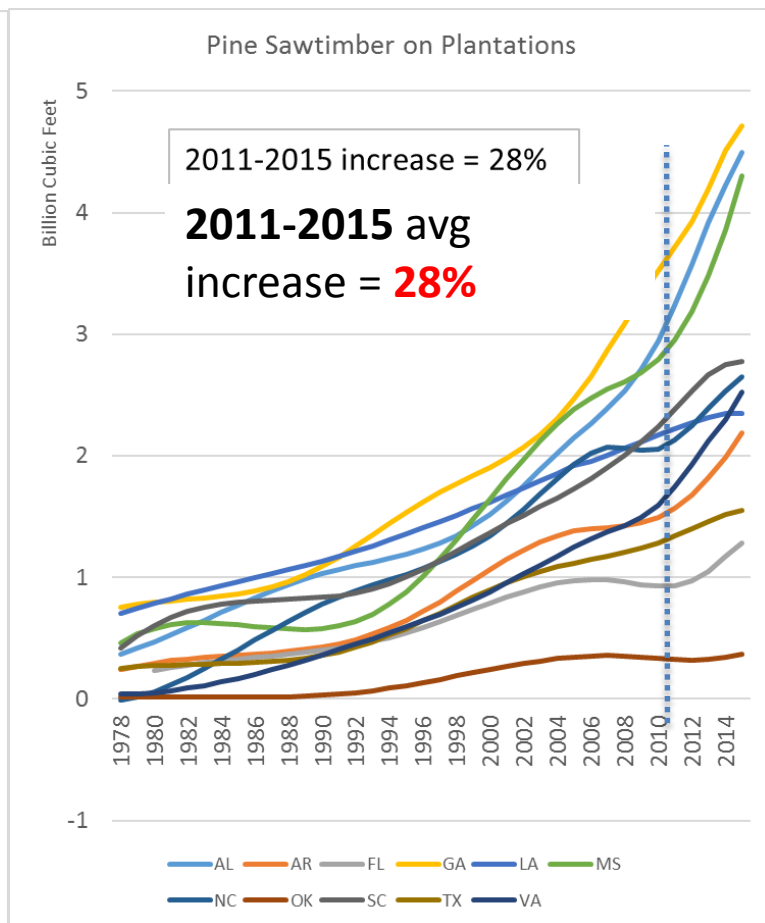
- A primary driver of the wood product industry.
- Housing market continues to improve, albeit slowly. Research shows not much of room to increase.

Oversupply—Inventory is accumulating

Pine non-Sawtimber Inventory on Plantations

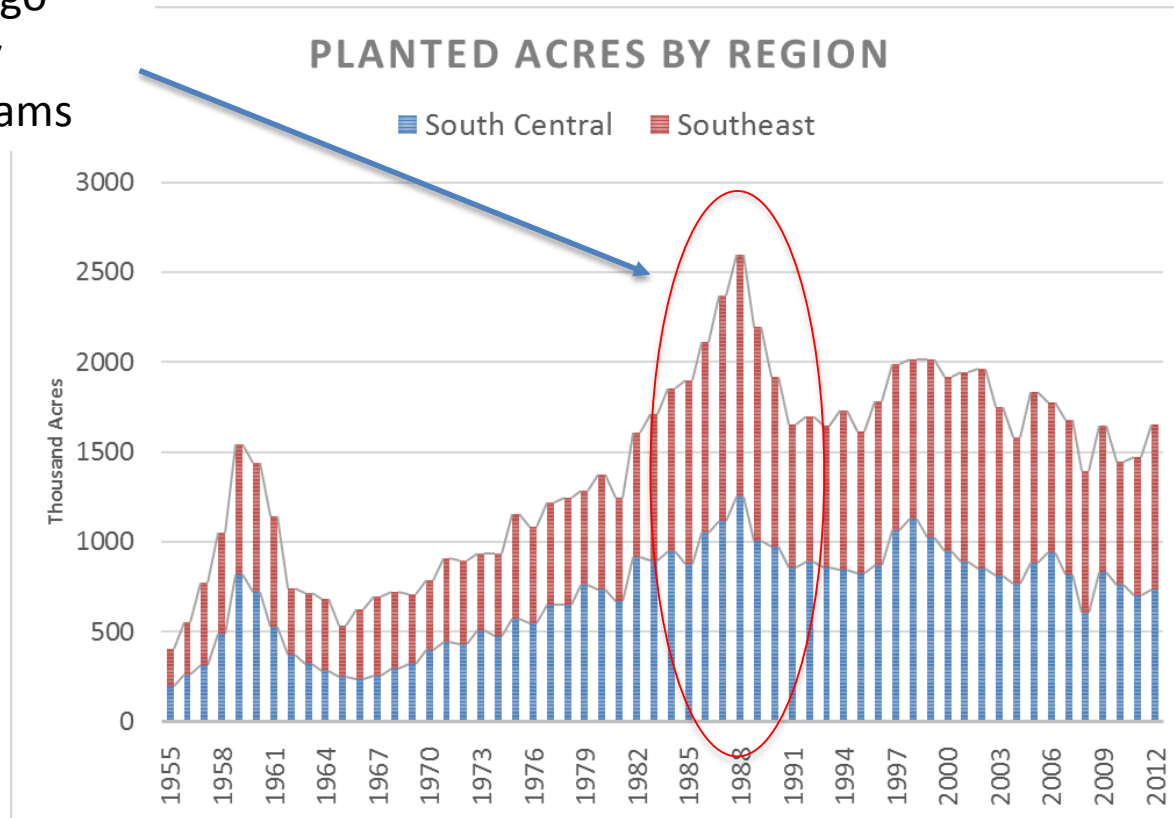


Pine Sawtimber Inventory on Plantations

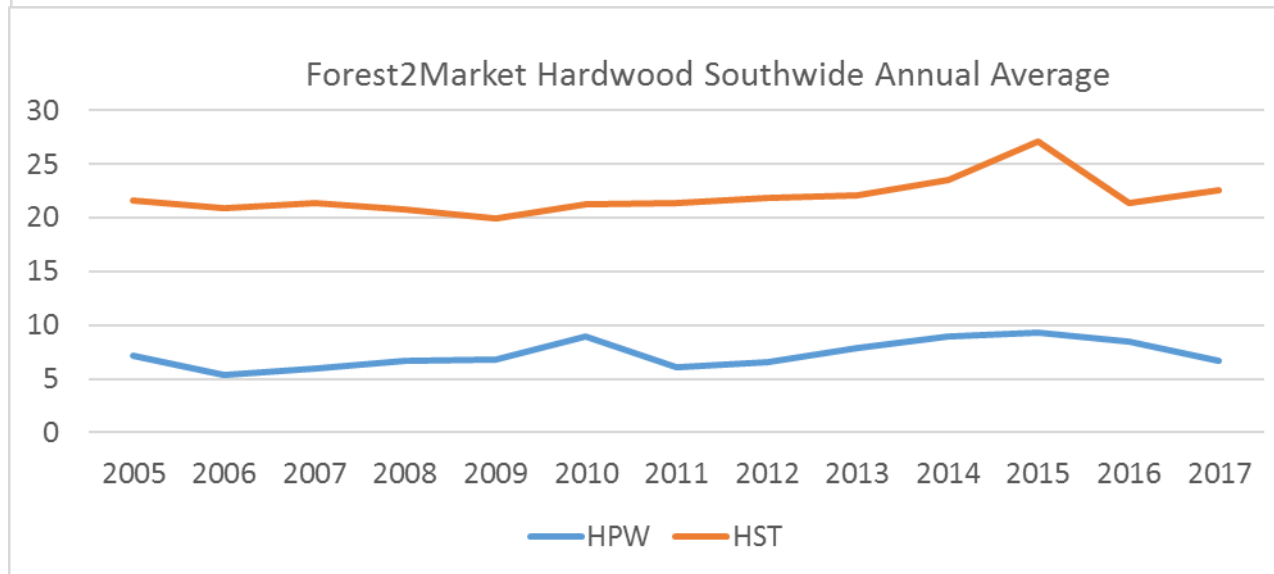
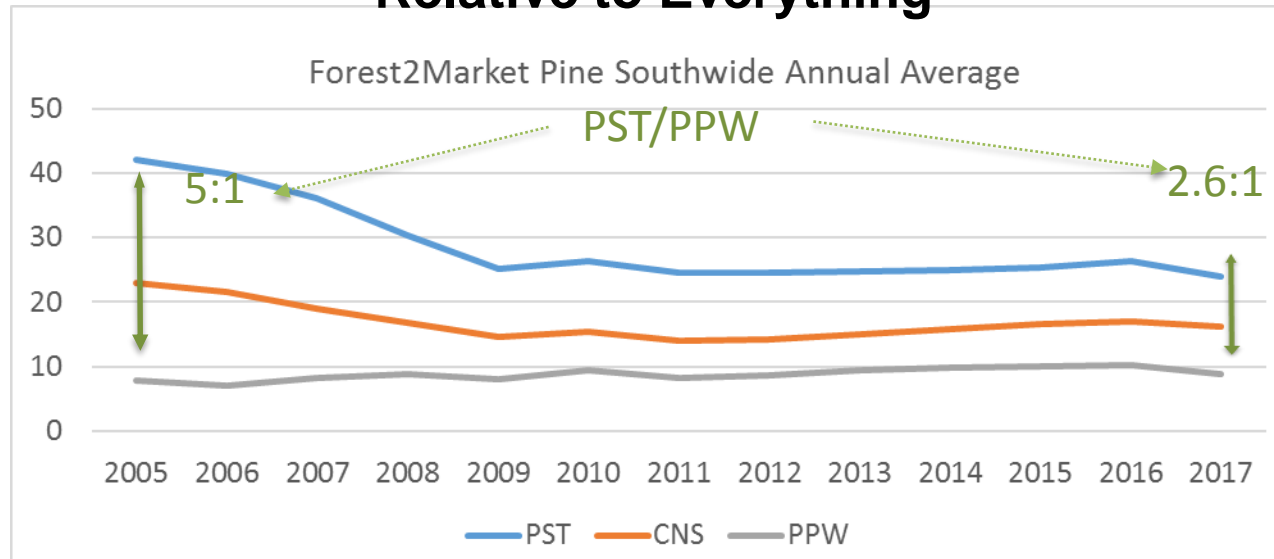


Why? Tree Planting Cycles in the South

We planted a lot of trees 30 yrs ago—
Supported by
federal programs



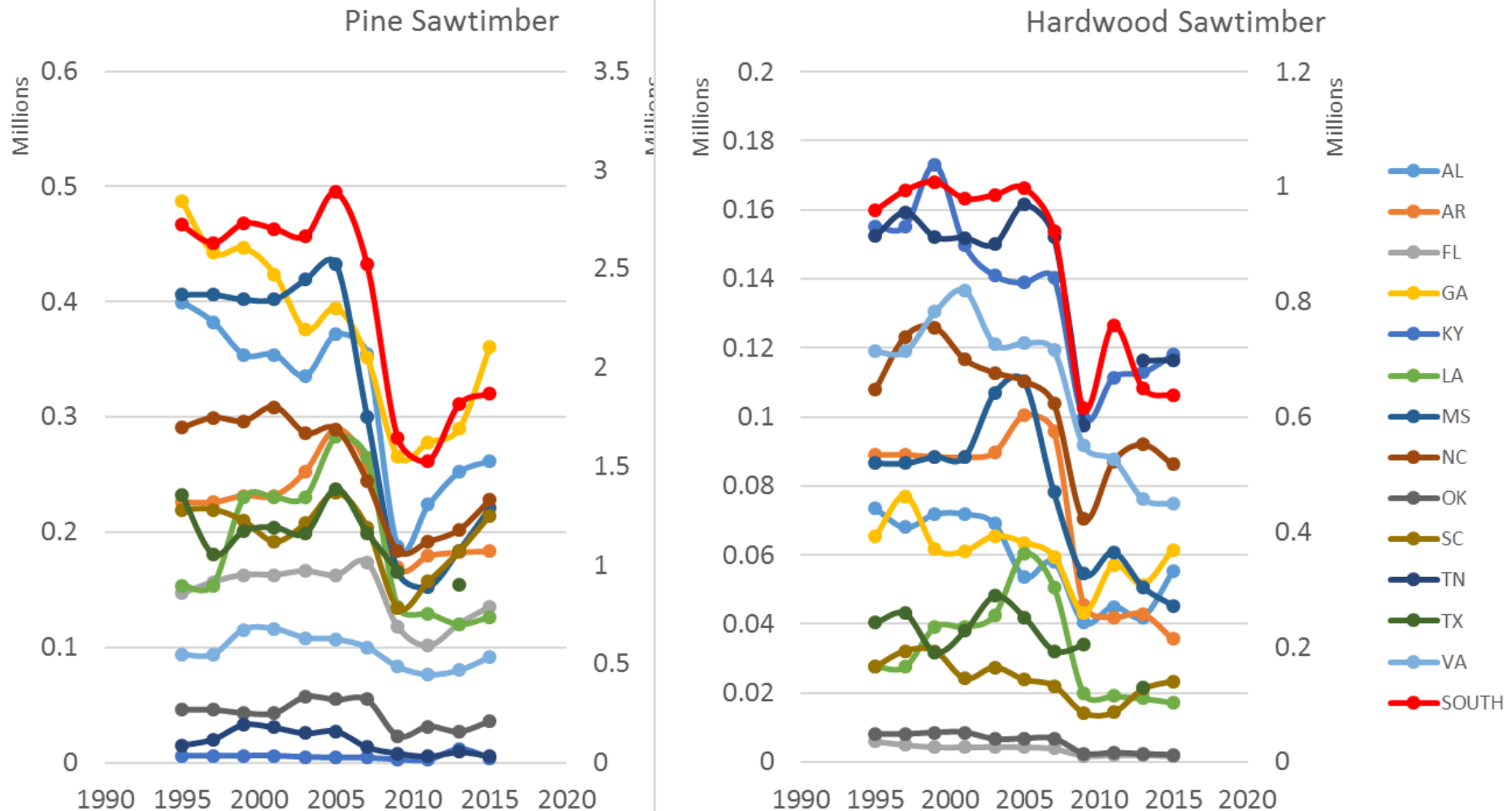
Pine sawtimber prices decline Relative to Everything



✓
PPW price
becomes
more
important

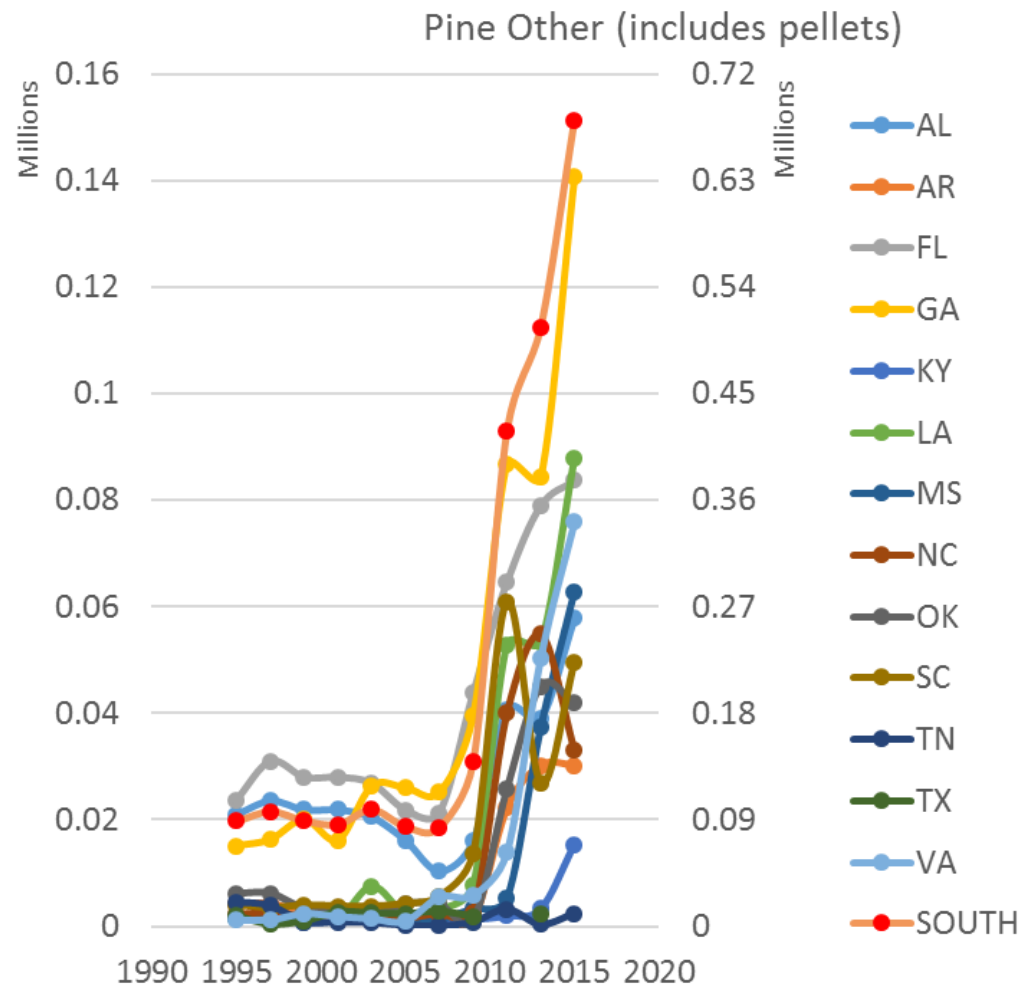
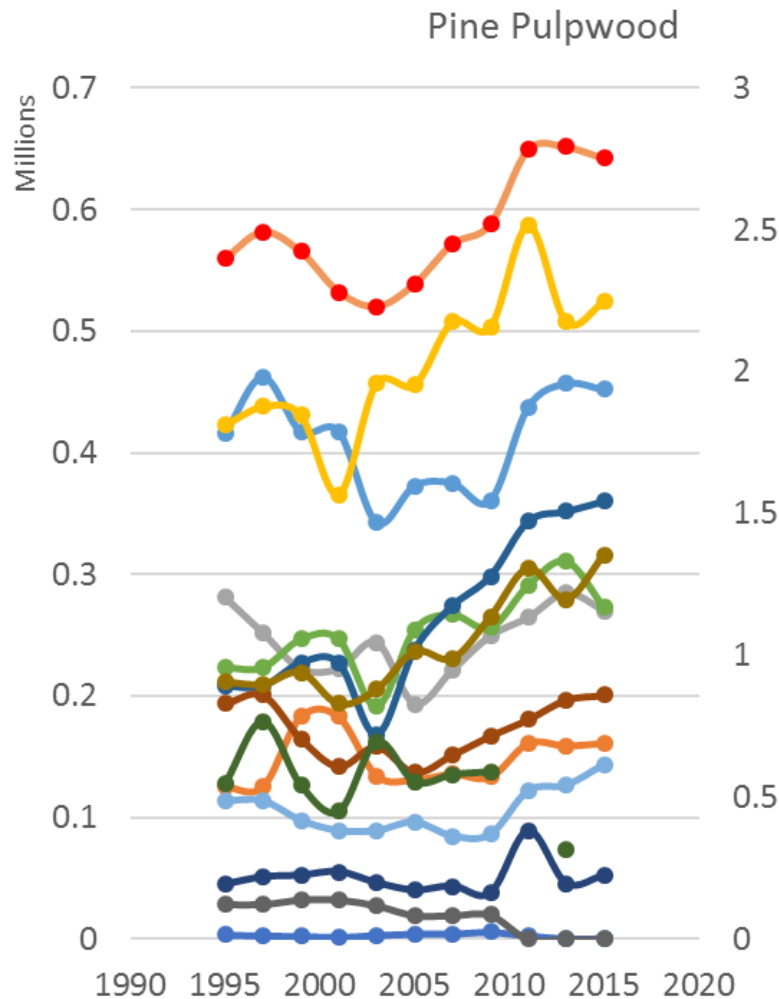
Harvest details: timber product output (demand)

w/2015 TPO

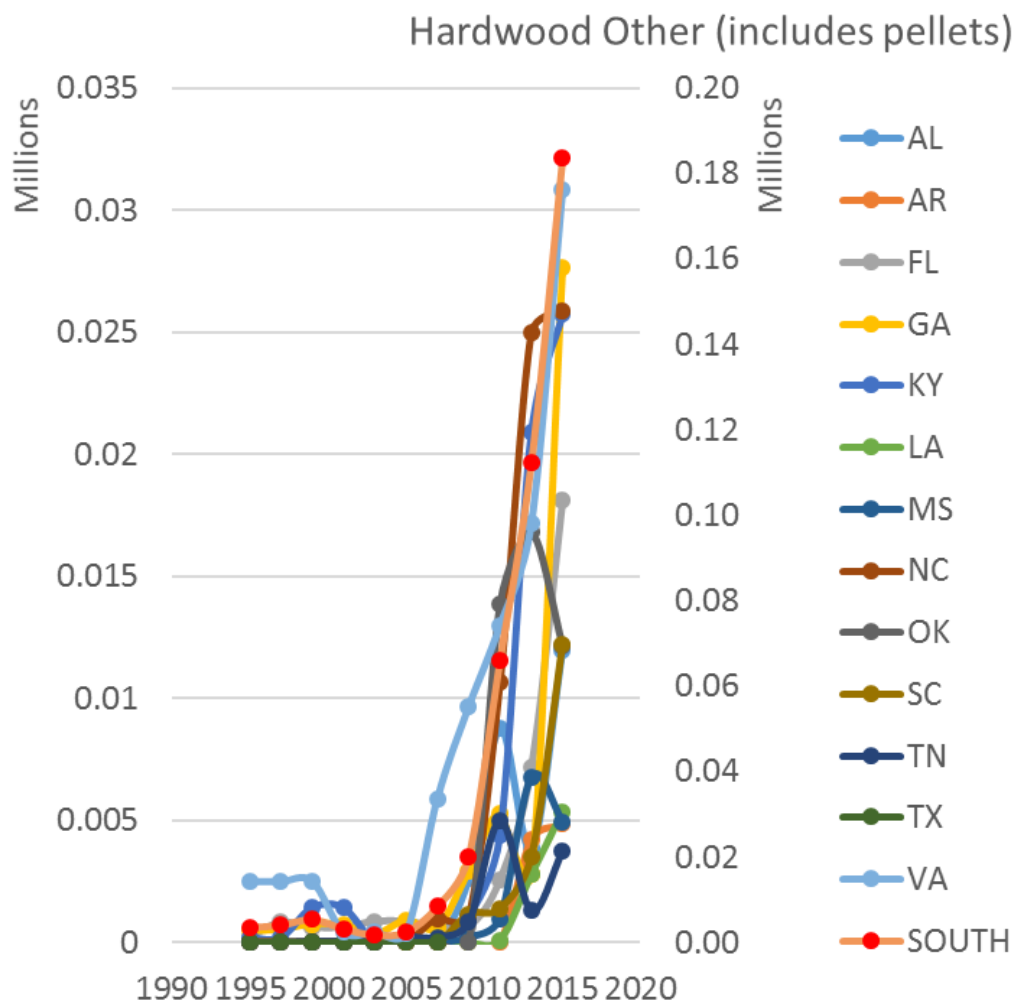
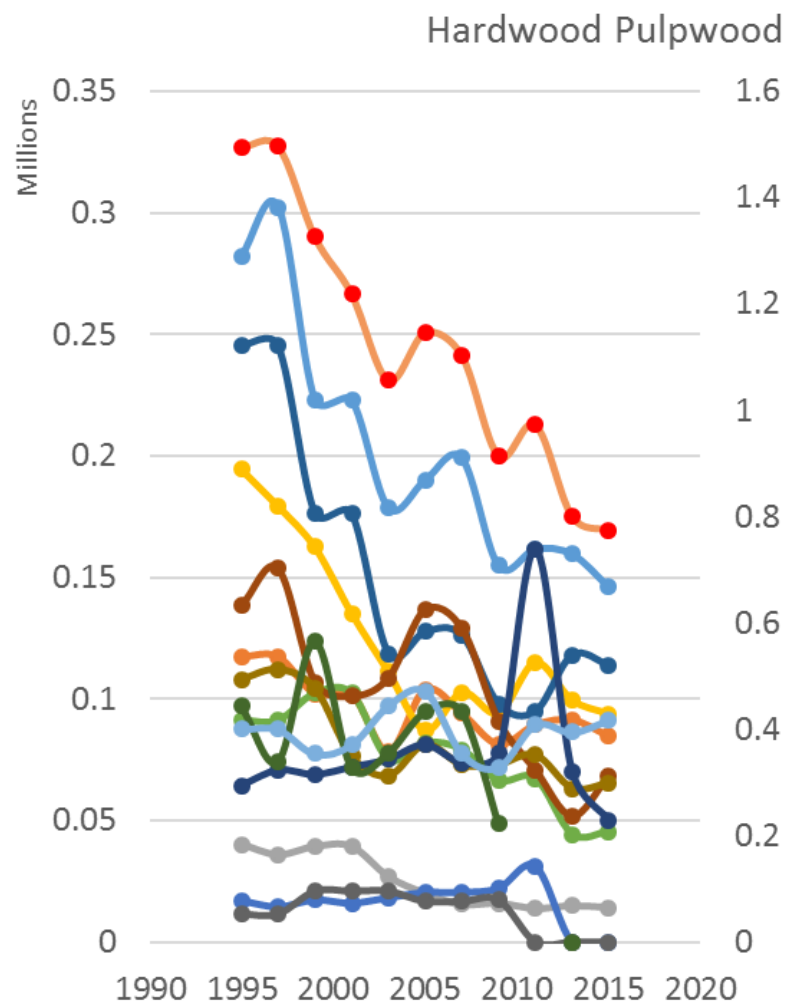


Pine pulpwood and Other

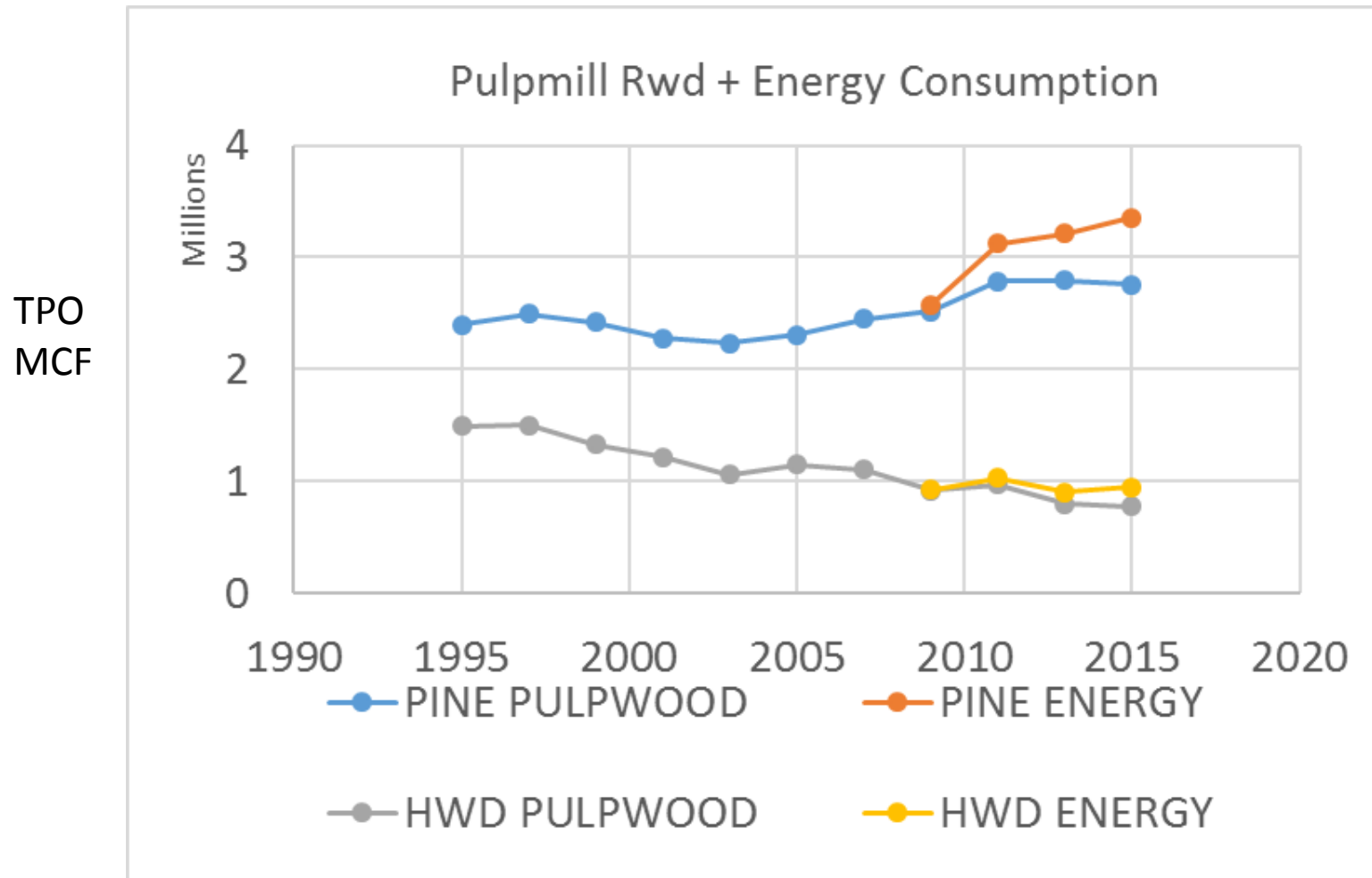
(includes pellets and energy)



Hardwood pulpwood and other (includes pellets and energy)

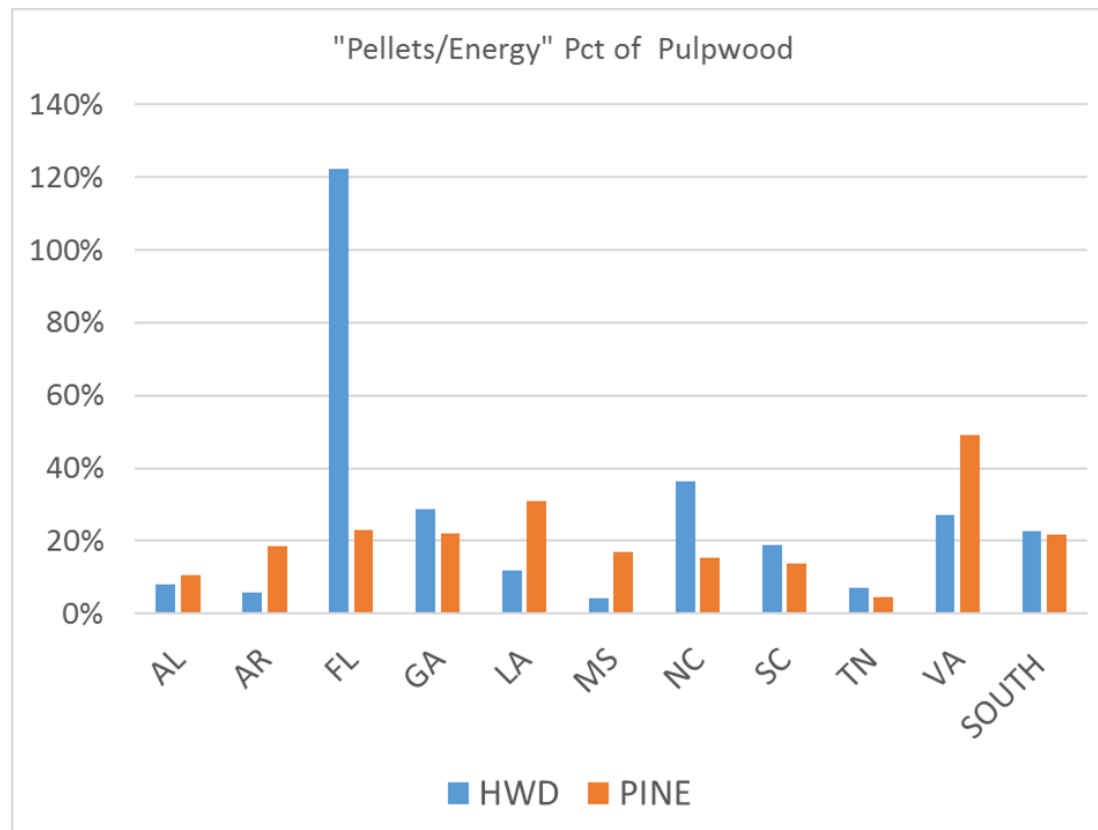


Small proportion but increasing trend



In 2015: pellet consumption (18% of total pine pulpwood), 19% of total hardwood pulpwood

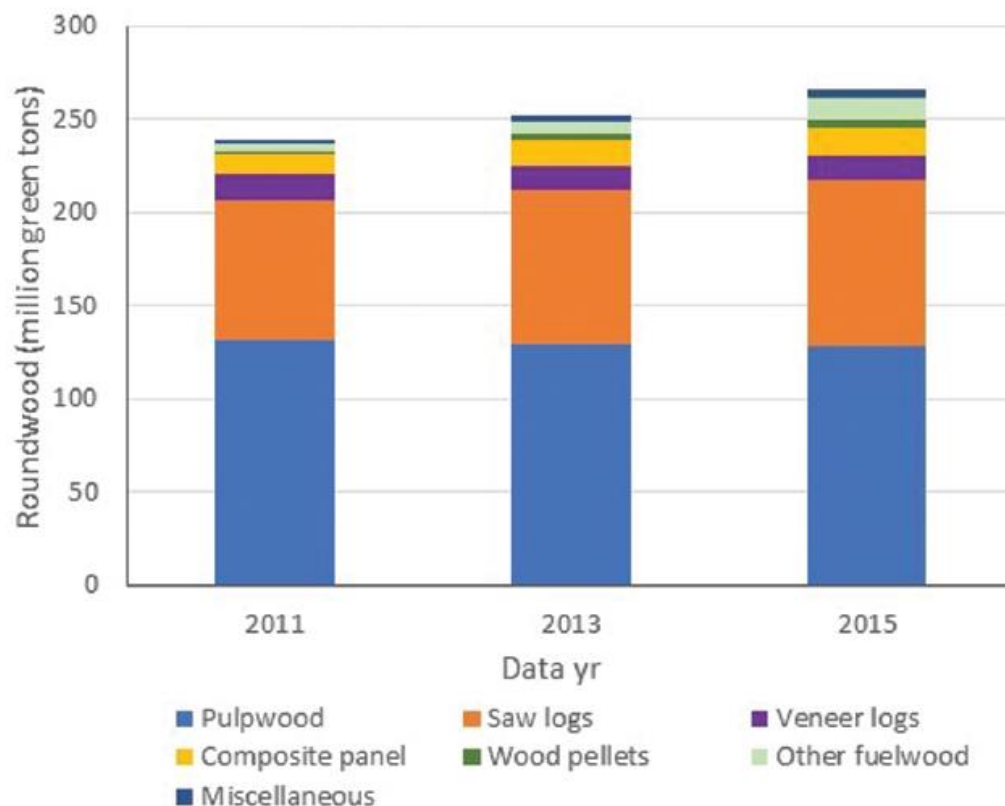
2015 TPO wood consumption pellet/energy % of pulpwood by state



Large
enough
share to
affect
market



But, how much of total timber goes to pellet industry?



About **2%** of all southern timber products and 27% of all industrial fuelwood output

Figure 4. Southern Timber Products Output volume by primary product, 2011–15. Miscellaneous includes posts, poles, pilings, and mulch mills.

Brandeis and Abt 2019

Annual biomass capacity

Table 5-3. National and regional densified biomass annual capacity, inclusive of plants in operation, temporarily not in operation, planned or under construction, and unknown status.

	Annual capacity (tons per year)
North region	2,438,580
South region	10,193,455
Rocky Mountain and Pacific Coast regions	1,117,848
United States total	13,749,883

Source: DOE EIA (2017)

Wood₂Energy Mills

Wood₂Energy

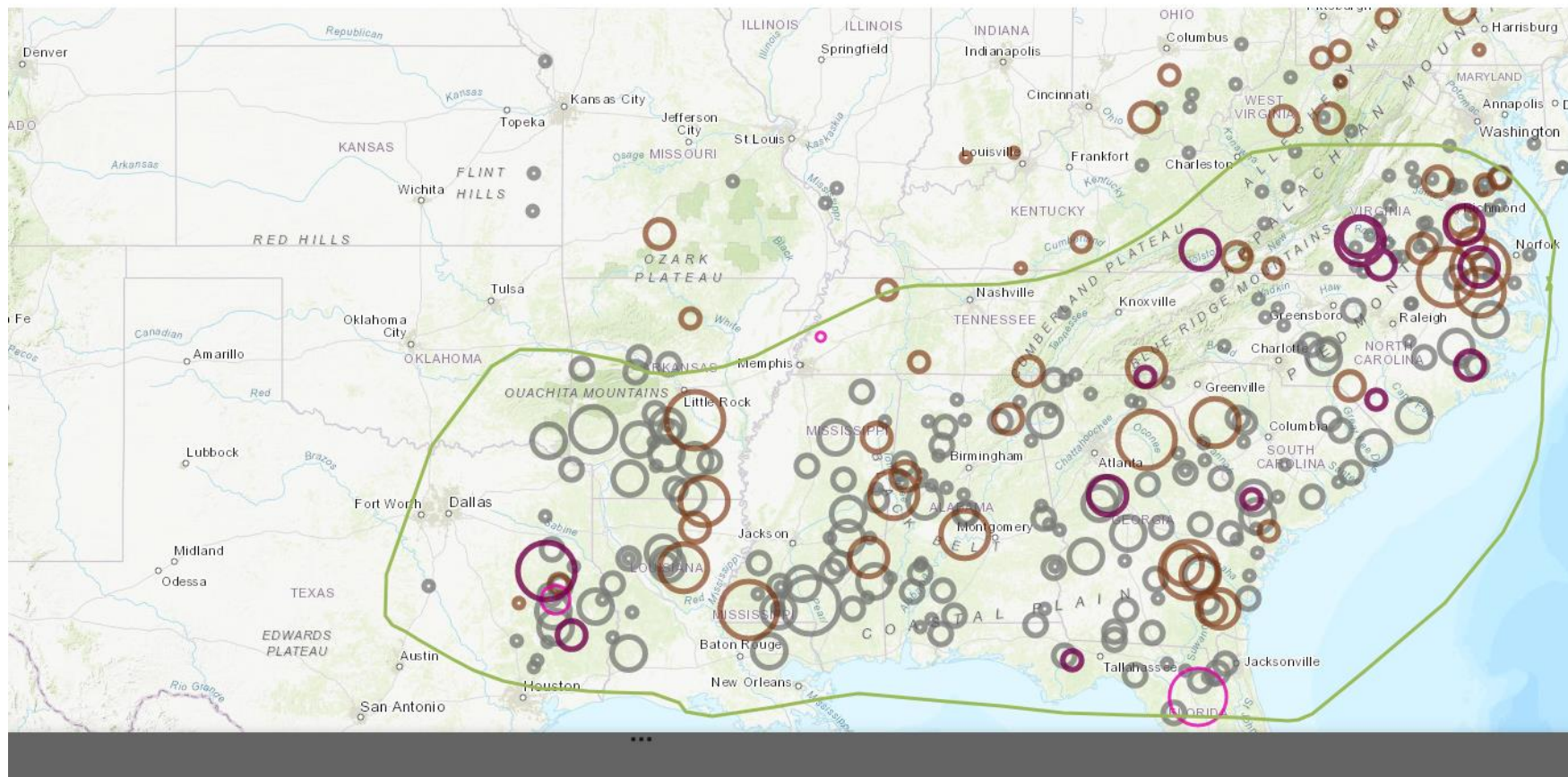
HOME

ABOUT

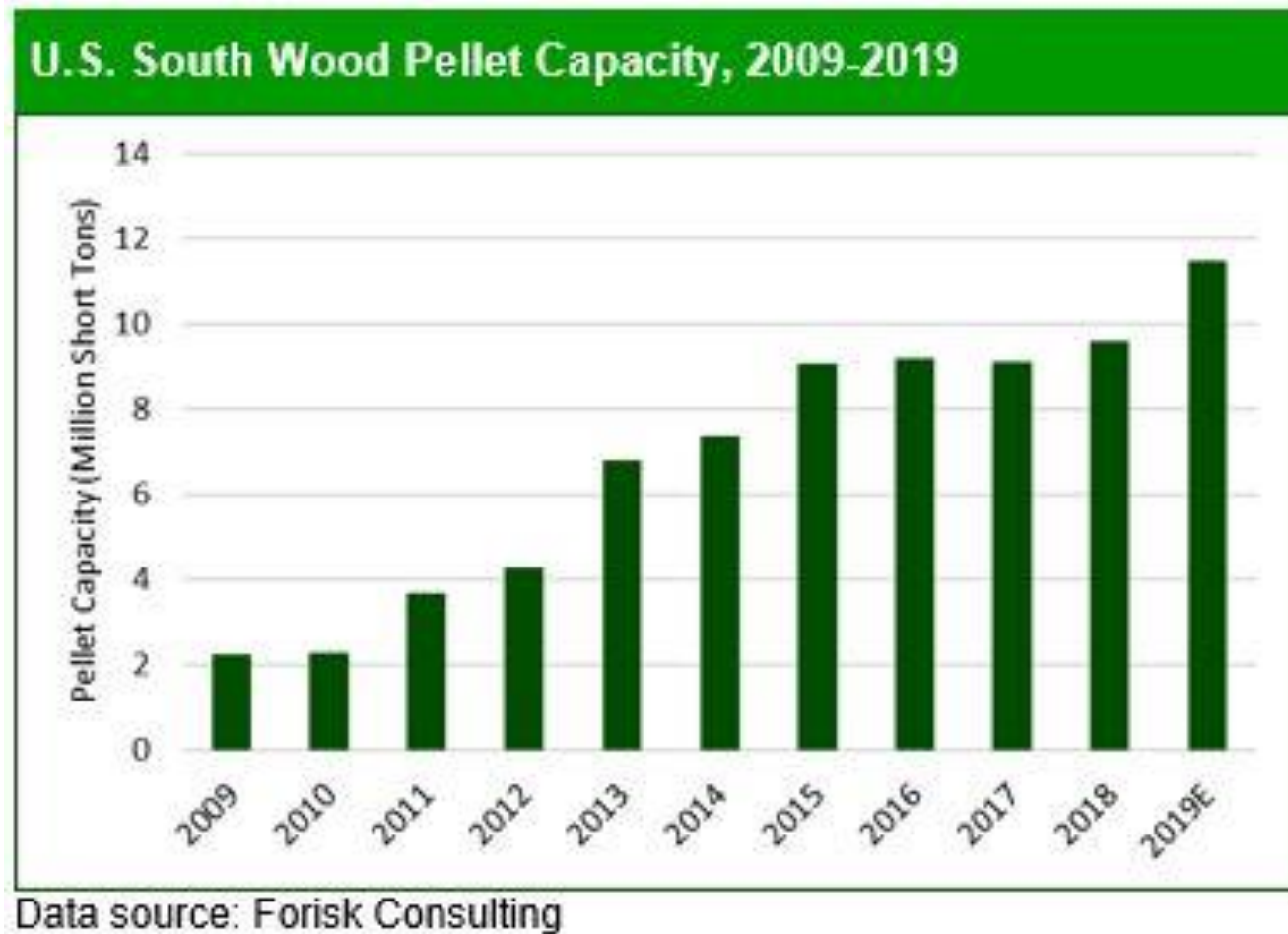
PARTNERS AND SPONSORS

MORE INFORMATION

CONTACT

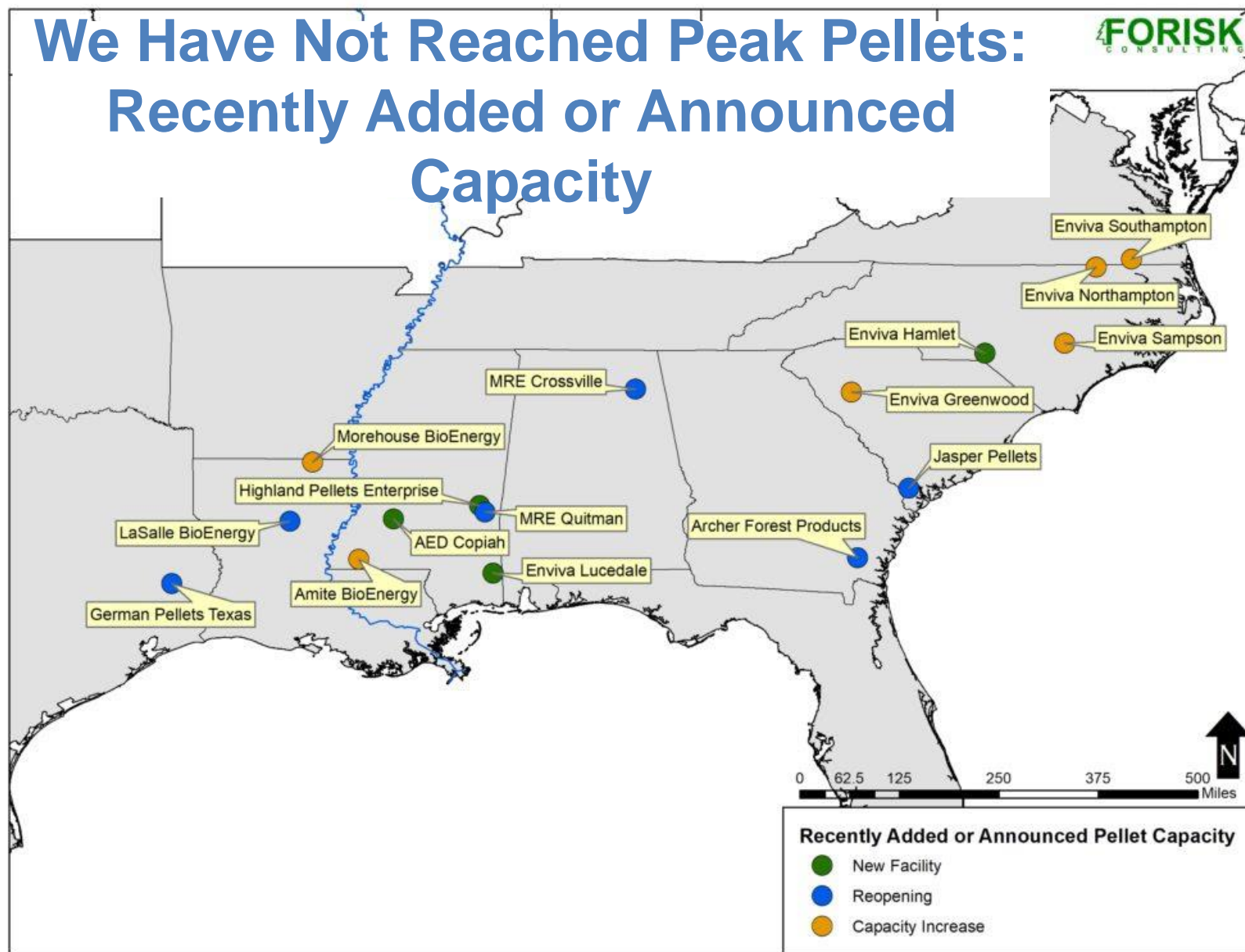


Wood pellet capacity in the U.S. South



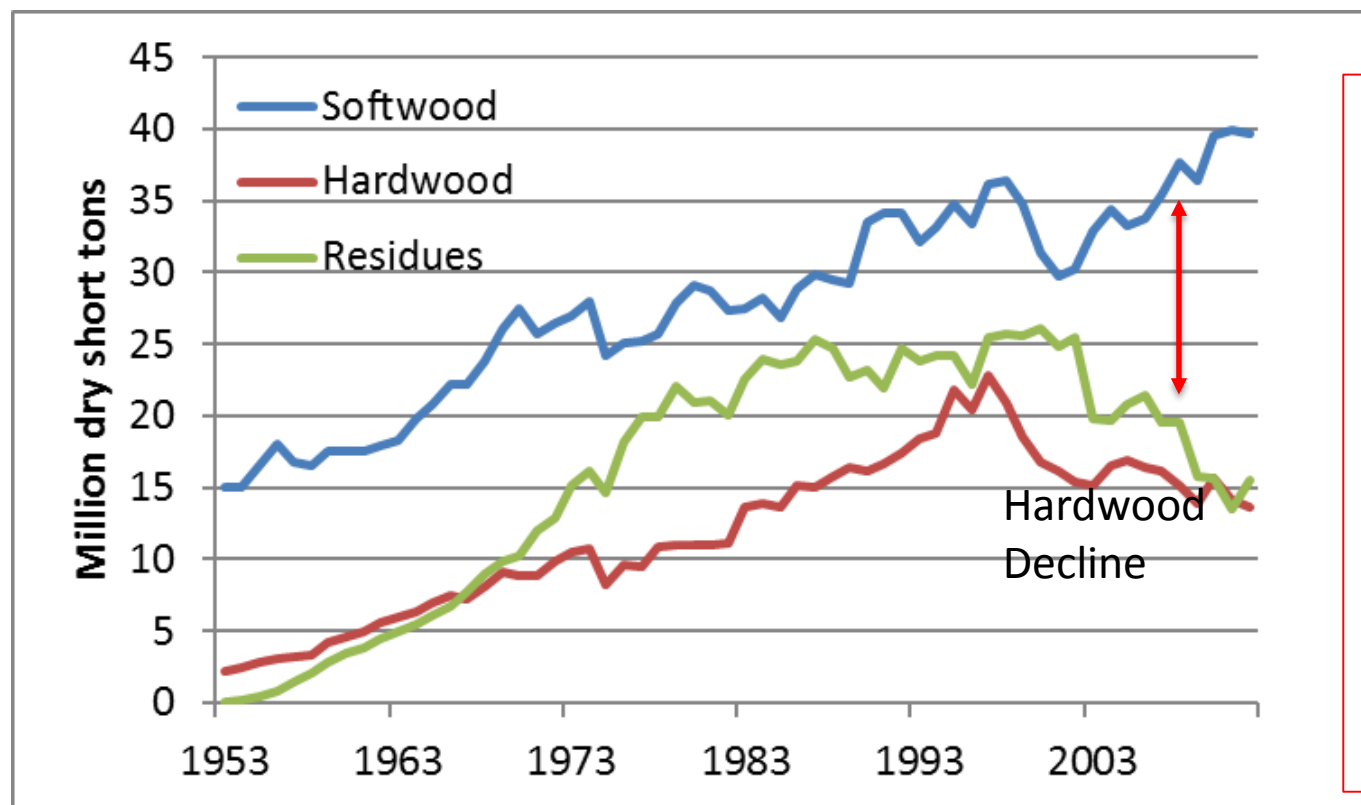
Southern capacity increased more than fivefold since 2009

We Have Not Reached Peak Pellets: Recently Added or Announced Capacity

FORISK
CONSULTING

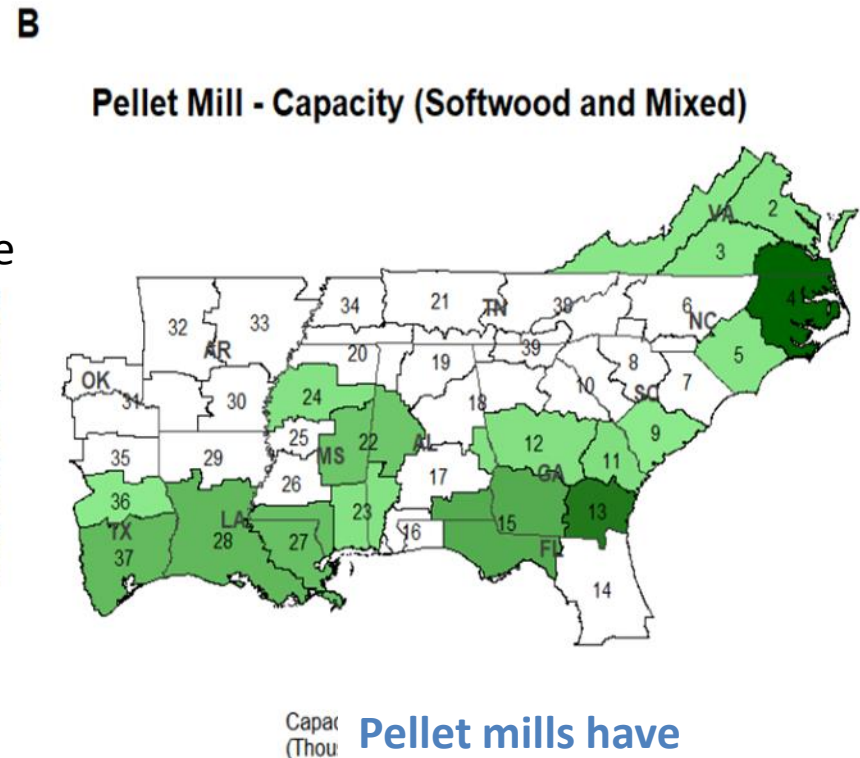
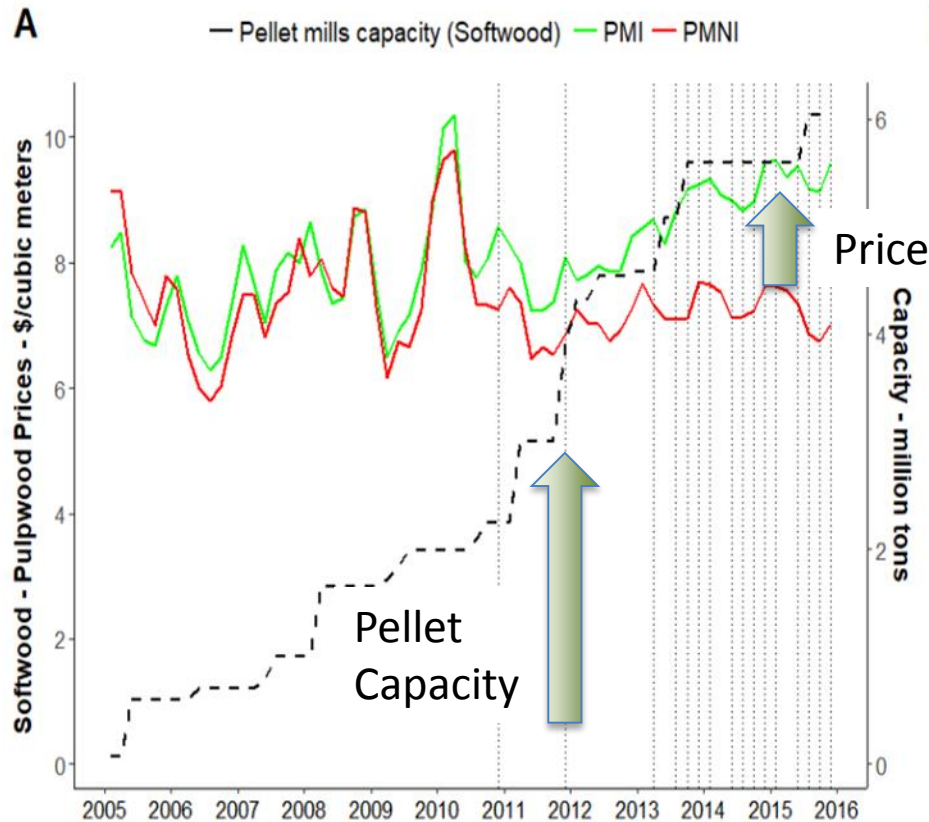
Pulpmill consumption trends:

How does sawmill production affect pellets?



Pulpmills switch to roundwood when mill residues disappear. Pulpmills and pellet mills compete for sawmill residue.

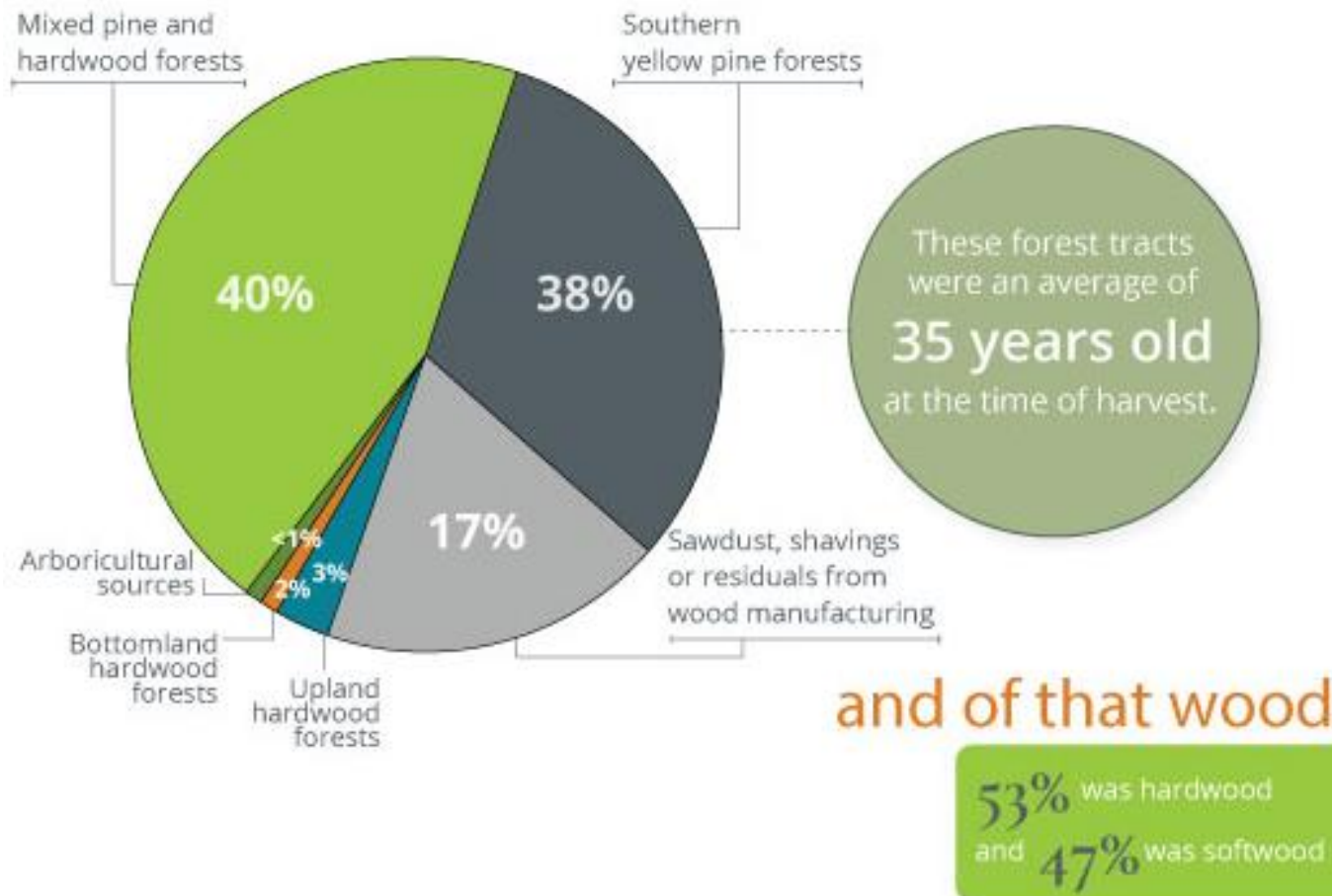
Pellet demand and pulpwood prices



Pellet mills have caused a structural change in the pulpwood prices

Enviva's feedstock sources

What is the source of Enviva's wood?



Enviva's feedstock sources

Chesapeake

The Chesapeake region includes the Ahoskie, Northampton, and Southampton mills.

Mixed Pine and Hardwood	55%
Southern Yellow Pine	25%
Mill & Industry Residues	14%
Upland Hardwood	3%
Bottomland Hardwood	3%



Wilmington

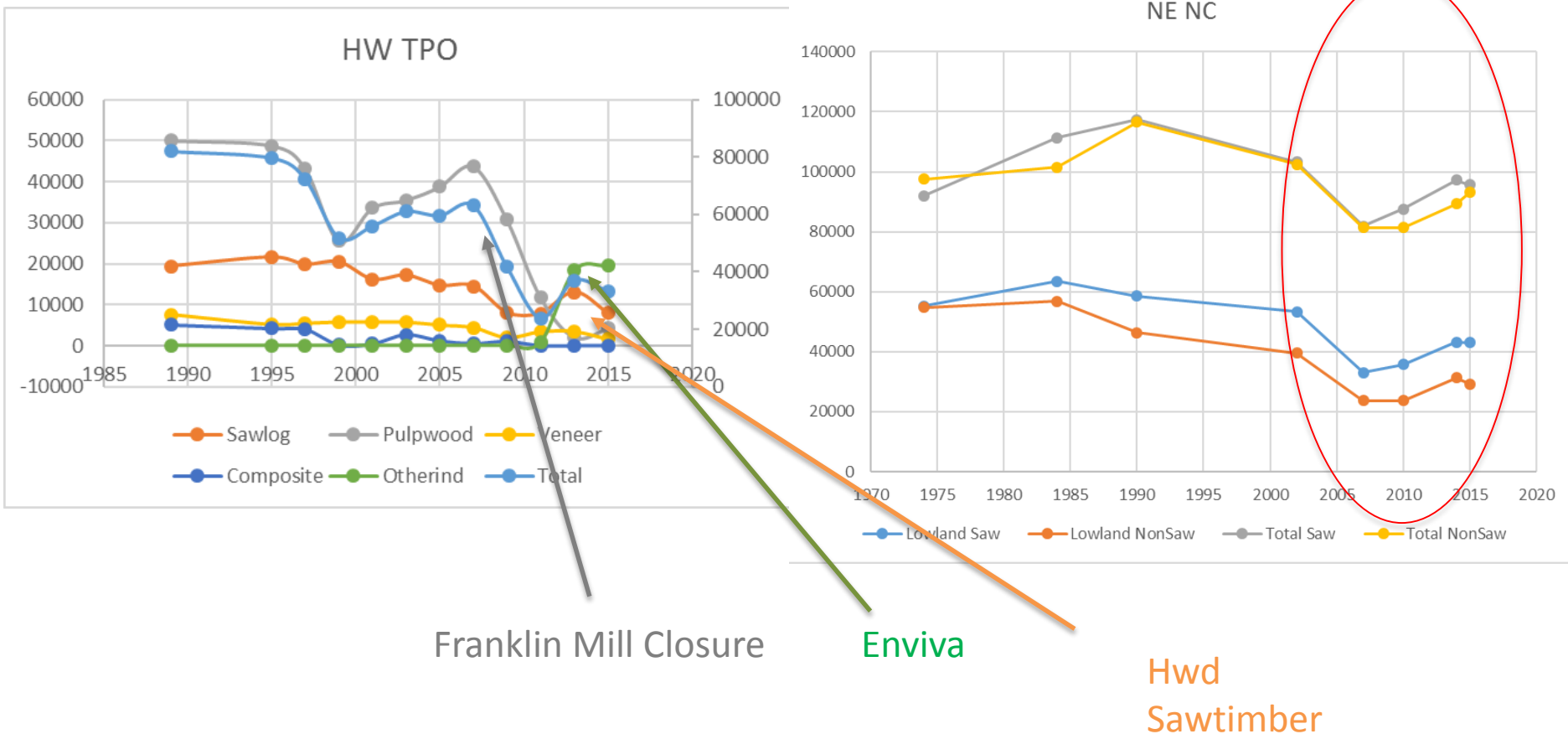
The Wilmington region includes the Sampson and Greenwood mills.

Mixed Pine and Hardwood	42%
Southern Yellow Pine	54%
Mill & Industry Residues	1%
Upland Hardwood	3%
Bottomland Hardwood	<1%

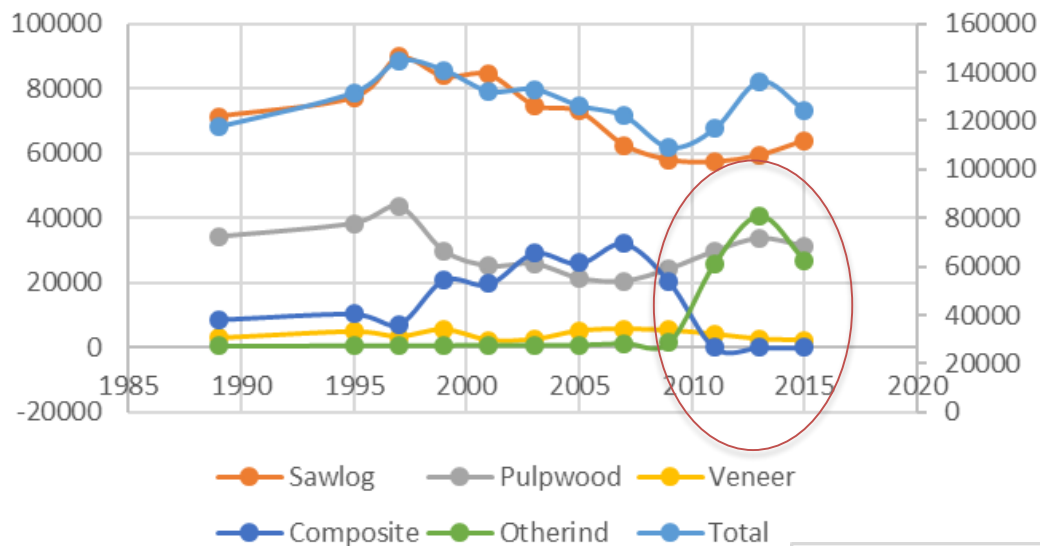
**Feedstock
varies by the
region**

NE NC hardwood

Mill consumption and inventory

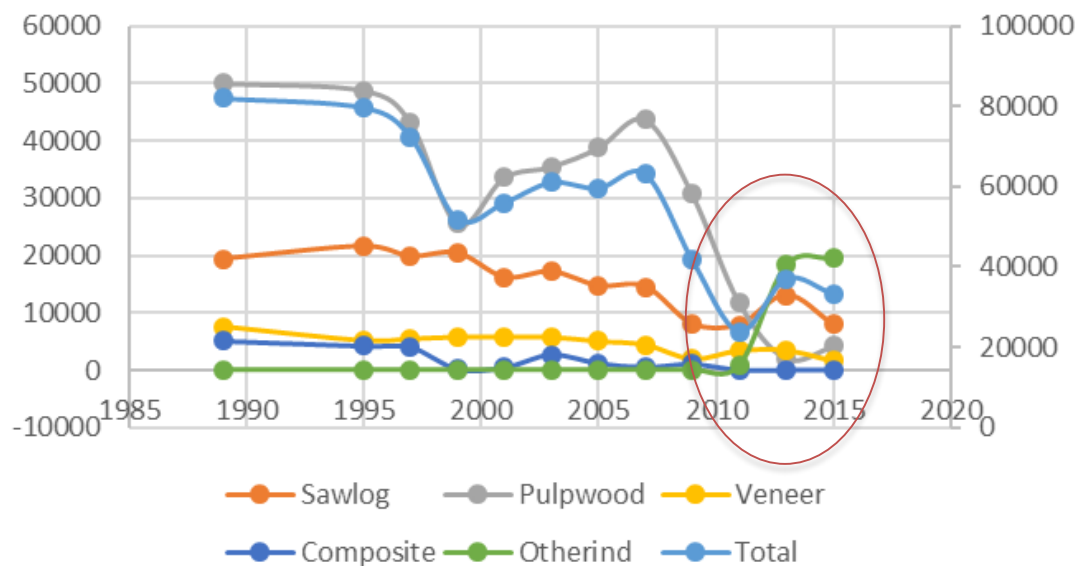


Pine Piedmont SW TPO

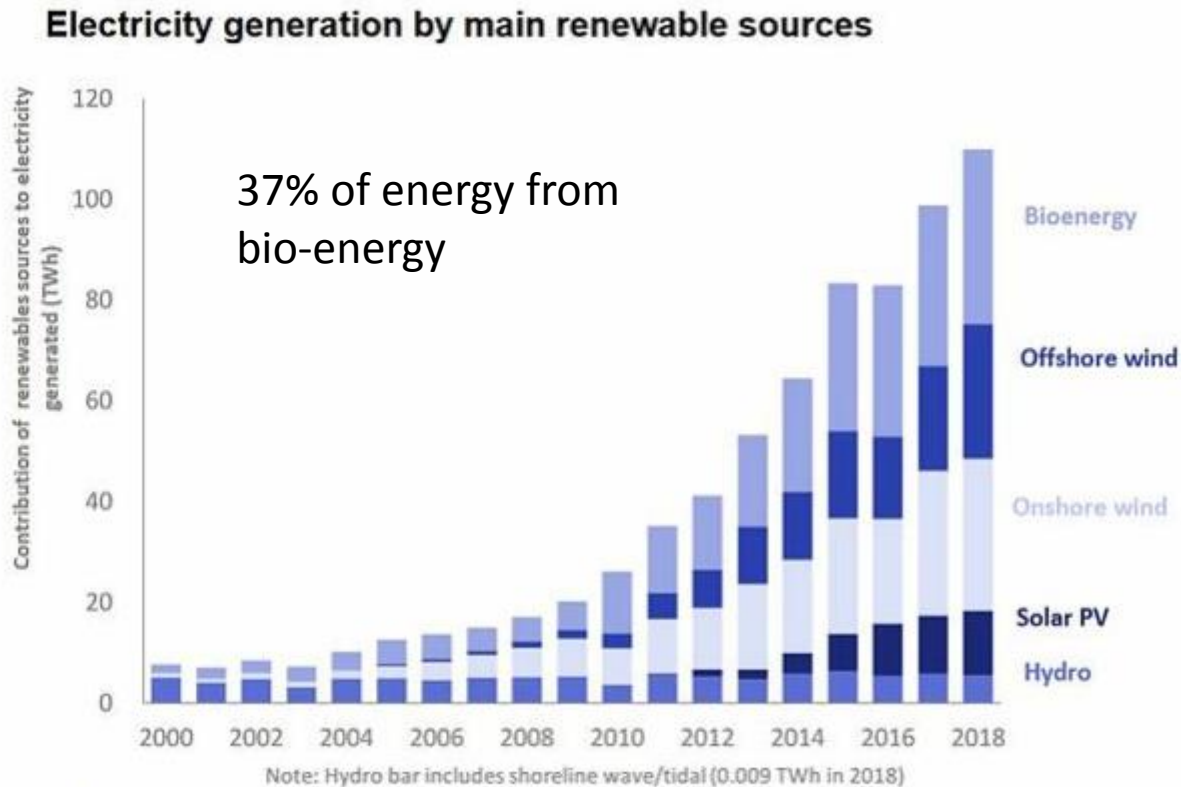


Pellets in NC

Hwd N. Coastal Plain HW TPO



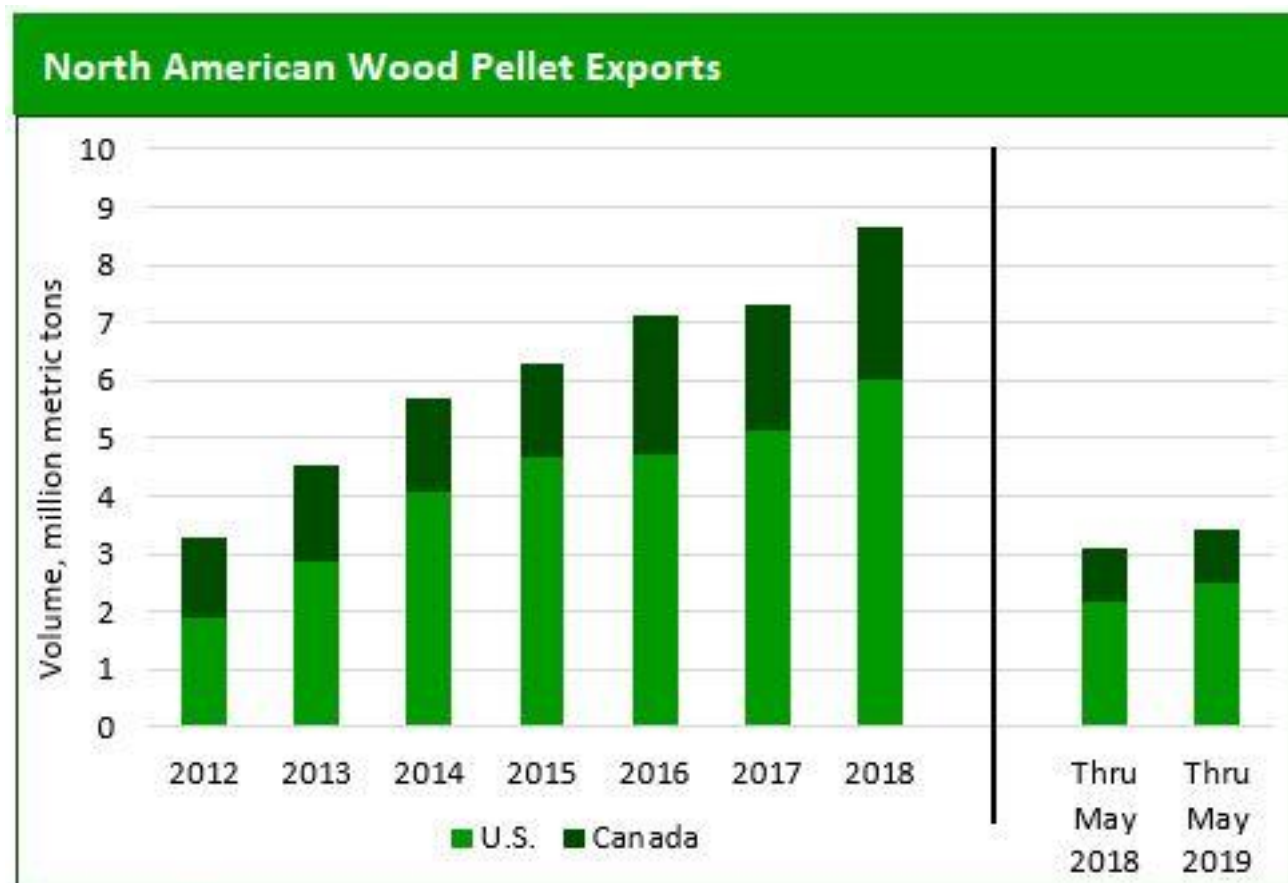
Pellets demand: Promising



UK electricity generation from all renewable resources at a record high in 2018: 110 Twh

SOURCE: *Digest of United Kingdom Energy Statistics (DUKES)*, U.K. Department for Business, Energy and Industrial Strategy

Pellets demand: Promising



Data Source: U.S. Census, Statistics Canada

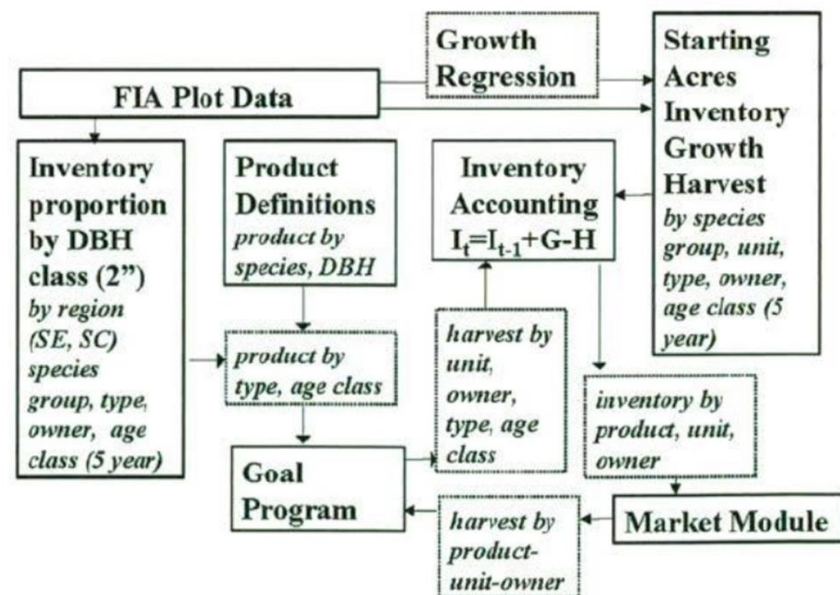
Pellet markets are expanding in Asian countries: Japan, S. Korea, and India

Source: FORISK

The two largest pellet producers in North America—**Enviva** and **Pinnacle**—have off-take contracts to Asia that will total more than 3.3 million metric tons per year by 2023.

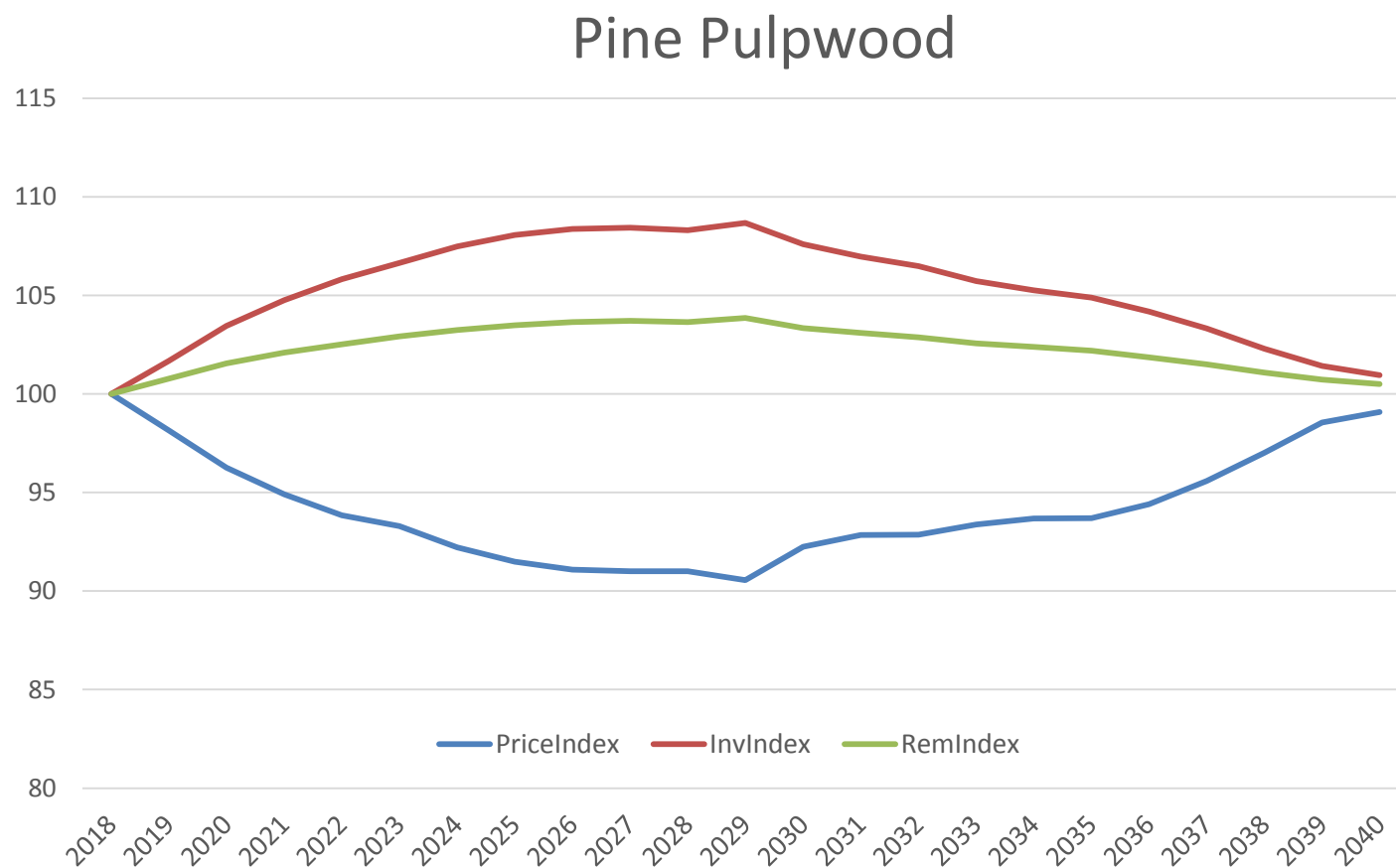
Southern timber markets projections

- **Subregional Timber Supply (SRTS)** model developed by SOFAC NCSU
- Based on FIA and TPO data
- Annually updated bio-economic model



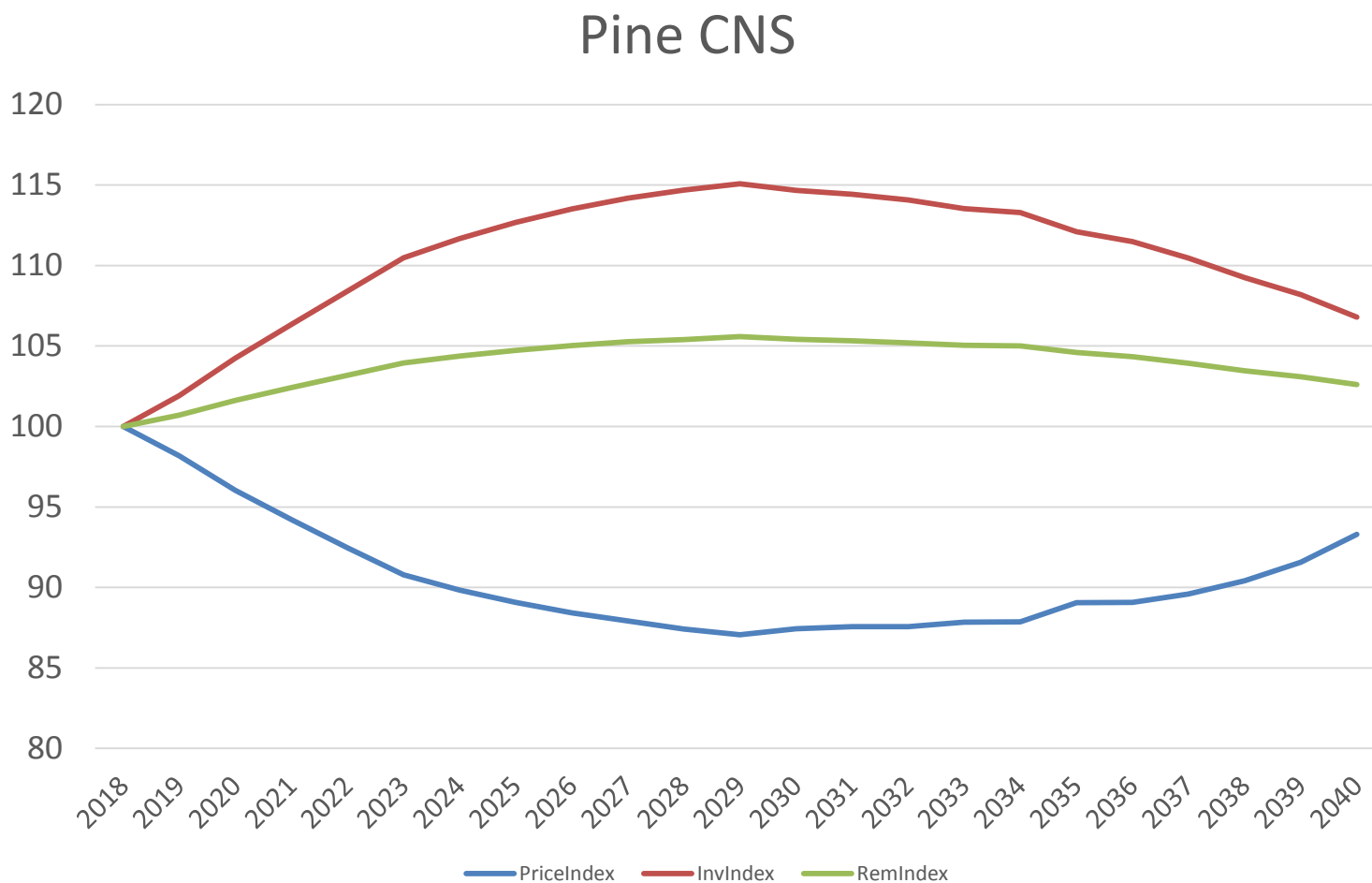
Southern Forest Resource
Assessment Consortium

SRTS projections: south-wide



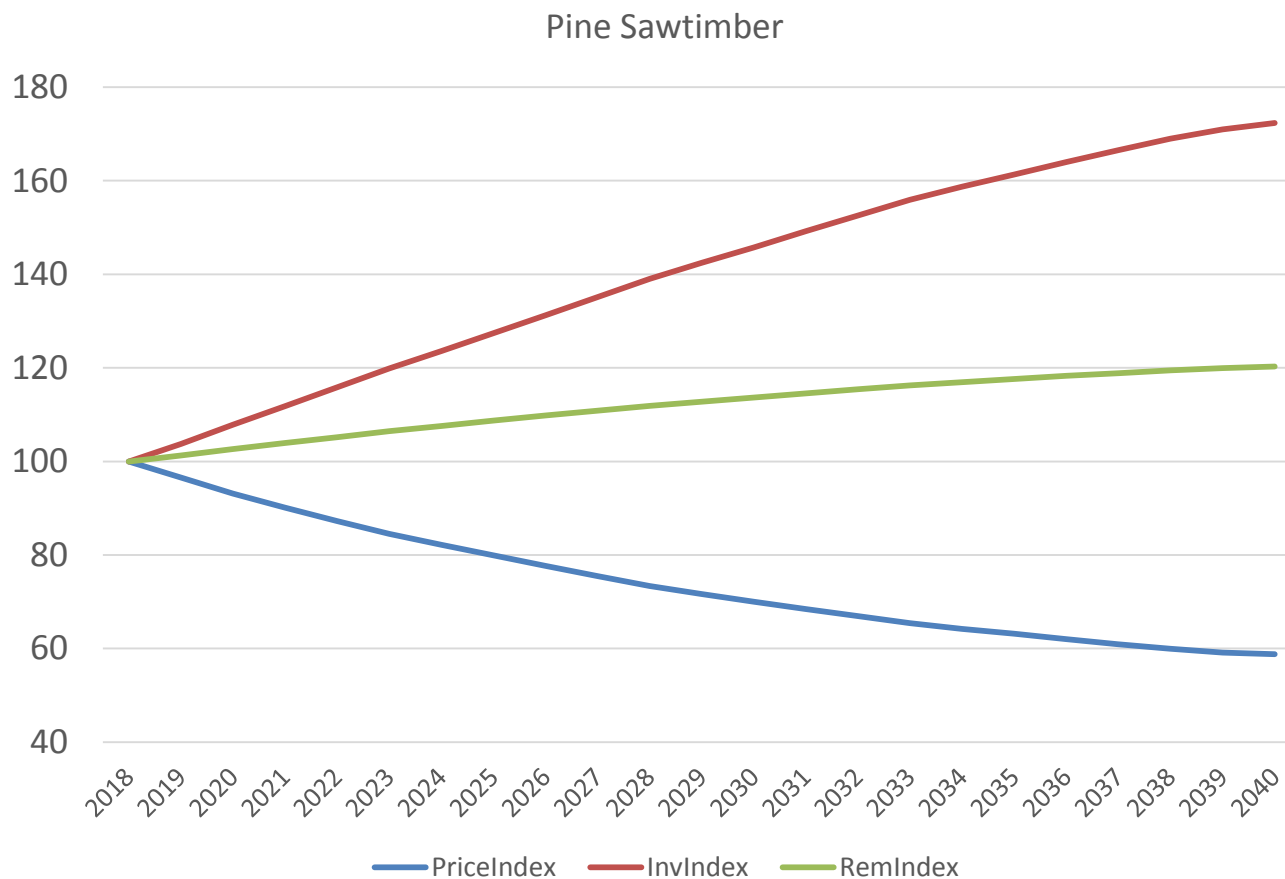
PINE PULPWOOD MARKETS in the South

SRTS projections: south-wide



PINE Chip-N-Saw MARKETS in the South

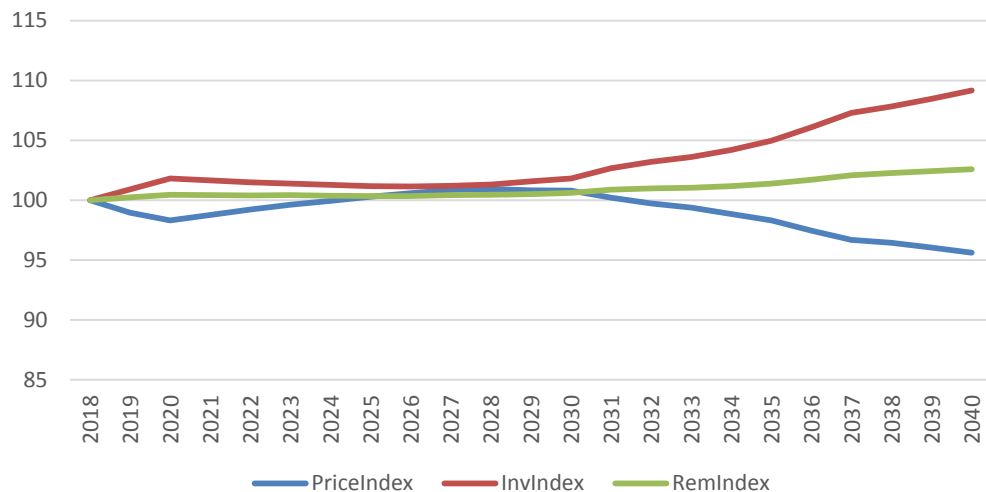
SRTS projections: south-wide



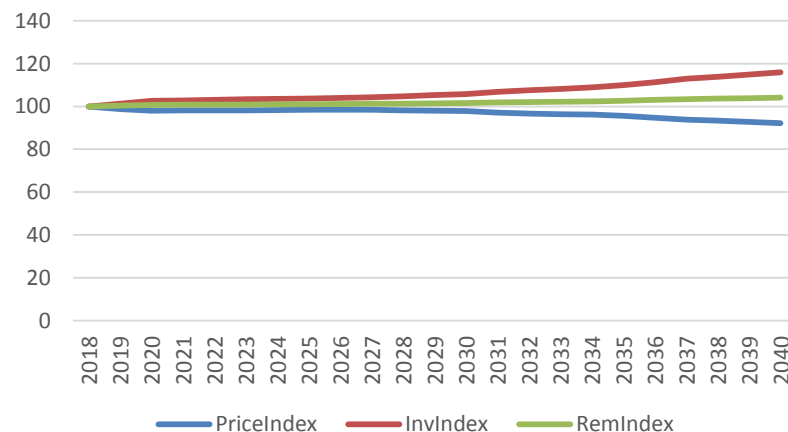
PINE Sawtimber MARKETS in the South

SRTS projections: south-wide

Hardwood Pulpwood



Hardwood Sawtimber



Hardwood MARKETS in the South

Summary

- Forest inventory in the South is rising
- Different timber market dynamics in the mix of wood energy and traditional timber products
- Increased demand has not depleted forests
- Woody biomass in the south seems a promising feedstock source



Thank you

- Rajan Parajuli, 919-513-2579, rparaju@ncsu.edu
- SOFAC NCSU (Bob Abt and Fred Cubbage)

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***Southern Forest Resource
Assessment Consortium***

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College of
Natural Resources

Department of Forestry &
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