

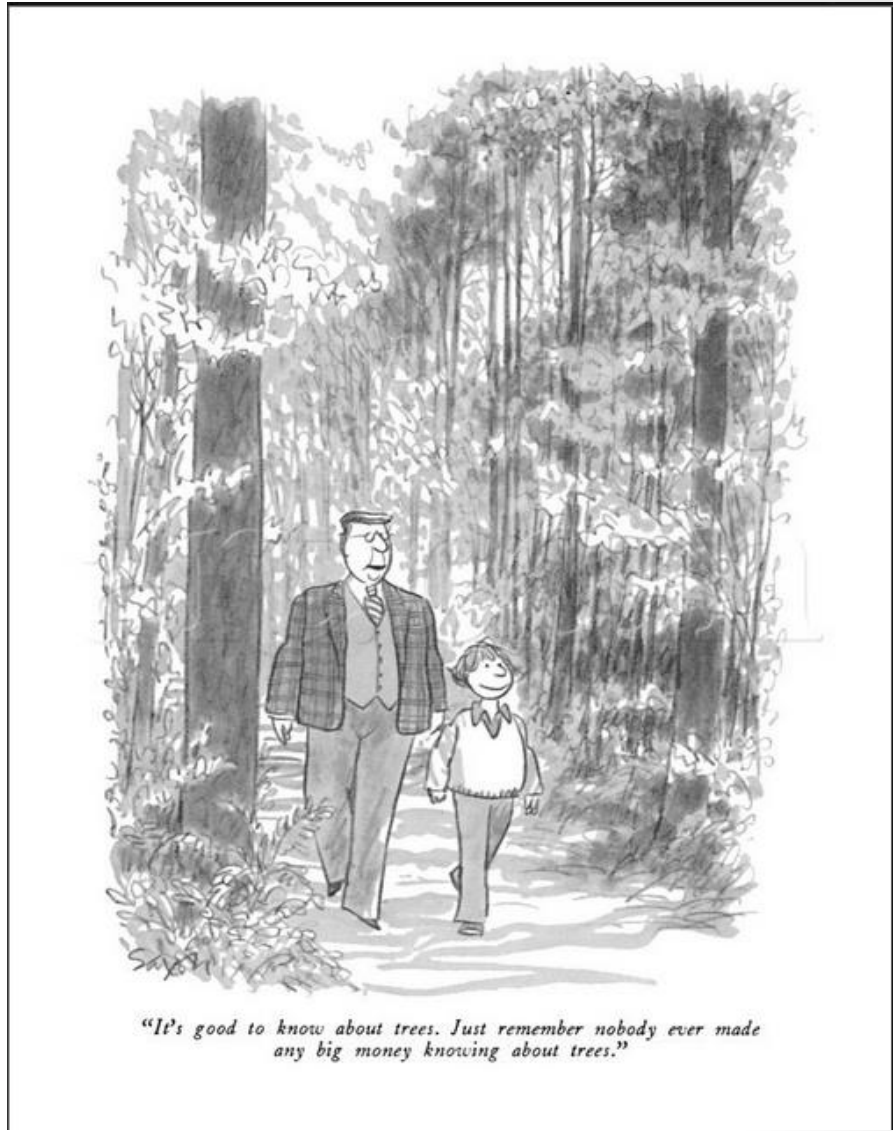
Situation and Outlook



William G. Hubbard, PhD

Regional Forester

Cooperative Extension Service – Southern Region

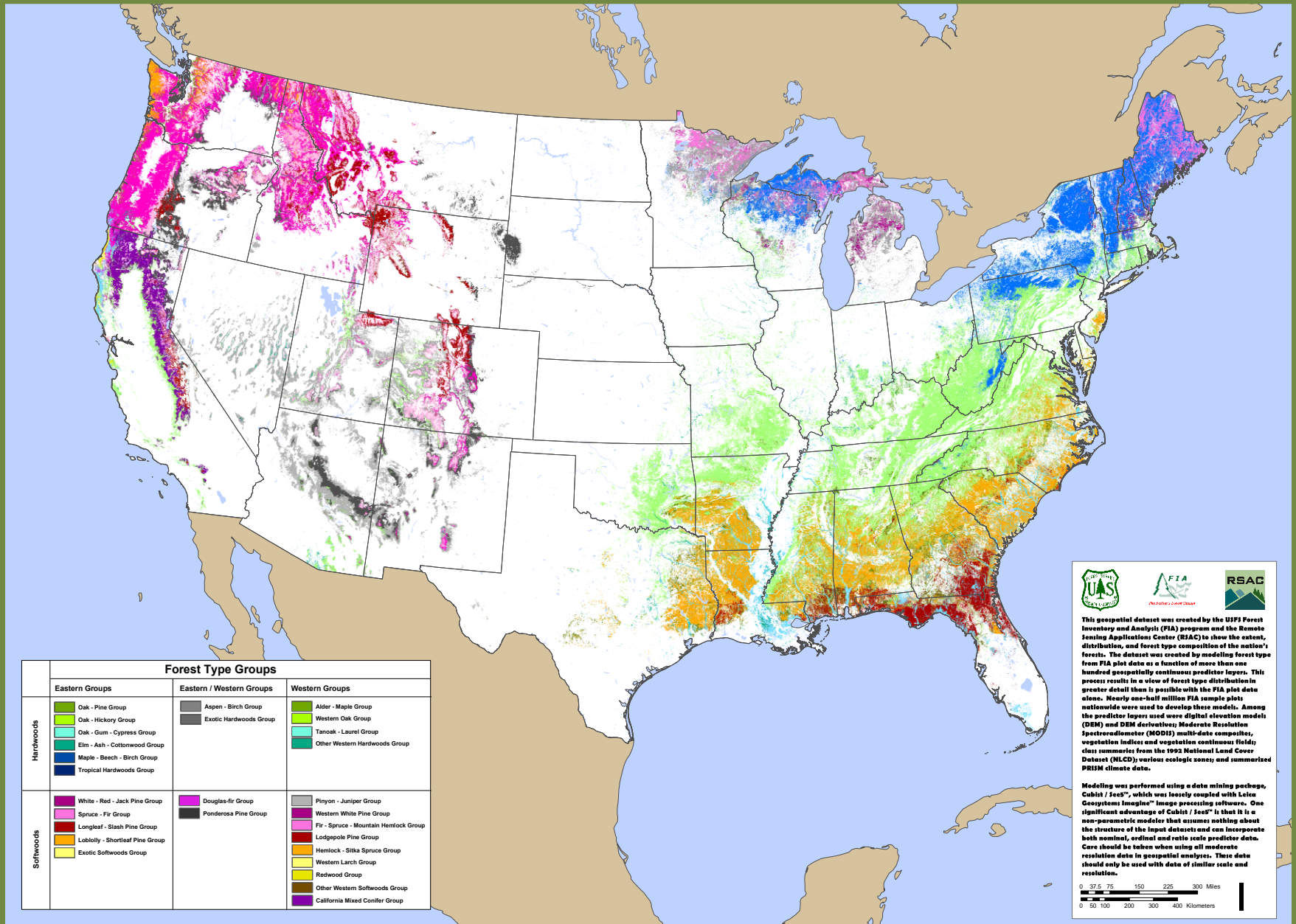


"It's good to know about trees. Just remember nobody ever made any big money knowing about trees."

Presentation Outline

- A brief look at forests of the South
- Current economic importance of forestry in the South
- Forestry from the consumer's perspective
 - Product uses, prices and trends
- Forestry from the producer's perspective
 - Ownership statistics & trends
 - Timber product prices and trends
- Policy
 - Farm Bill
 - Tax
- Issues affecting the forestry situation & outlook
 - Green building & certification of forests and wood products
 - Climate change
 - Bioenergy
 - Globalization trends
 - Land use changes
 - "Checkoff programs"

National Forest Type Groups

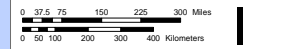


Forest Type Groups			
	Eastern Groups	Western Groups	
Hardwoods	Oak - Pine Group	Aspen - Birch Group	Alder - Maple Group
	Oak - Hickory Group	Exotic Hardwoods Group	Western Oak Group
	Oak - Gum - Cypress Group		Tanoak - Laurel Group
	Elm - Ash - Cottonwood Group		Other Western Hardwoods Group
	Maple - Beech - Birch Group		
	Tropical Hardwoods Group		
Softwoods	White - Red - Jack Pine Group	Douglas-fir Group	Piñon - Juniper Group
	Spruce - Fir Group	Ponderosa Pine Group	Western White Pine Group
	Longleaf - Slash Pine Group		Fir - Spruce - Mountain Hemlock Group
	Loblolly - Shortleaf Pine Group		Lodgepole Pine Group
	Exotic Softwoods Group		Hemlock - Sitka Spruce Group
			Western Larch Group
			Redwood Group
			Other Western Softwoods Group
			California Mixed Conifer Group

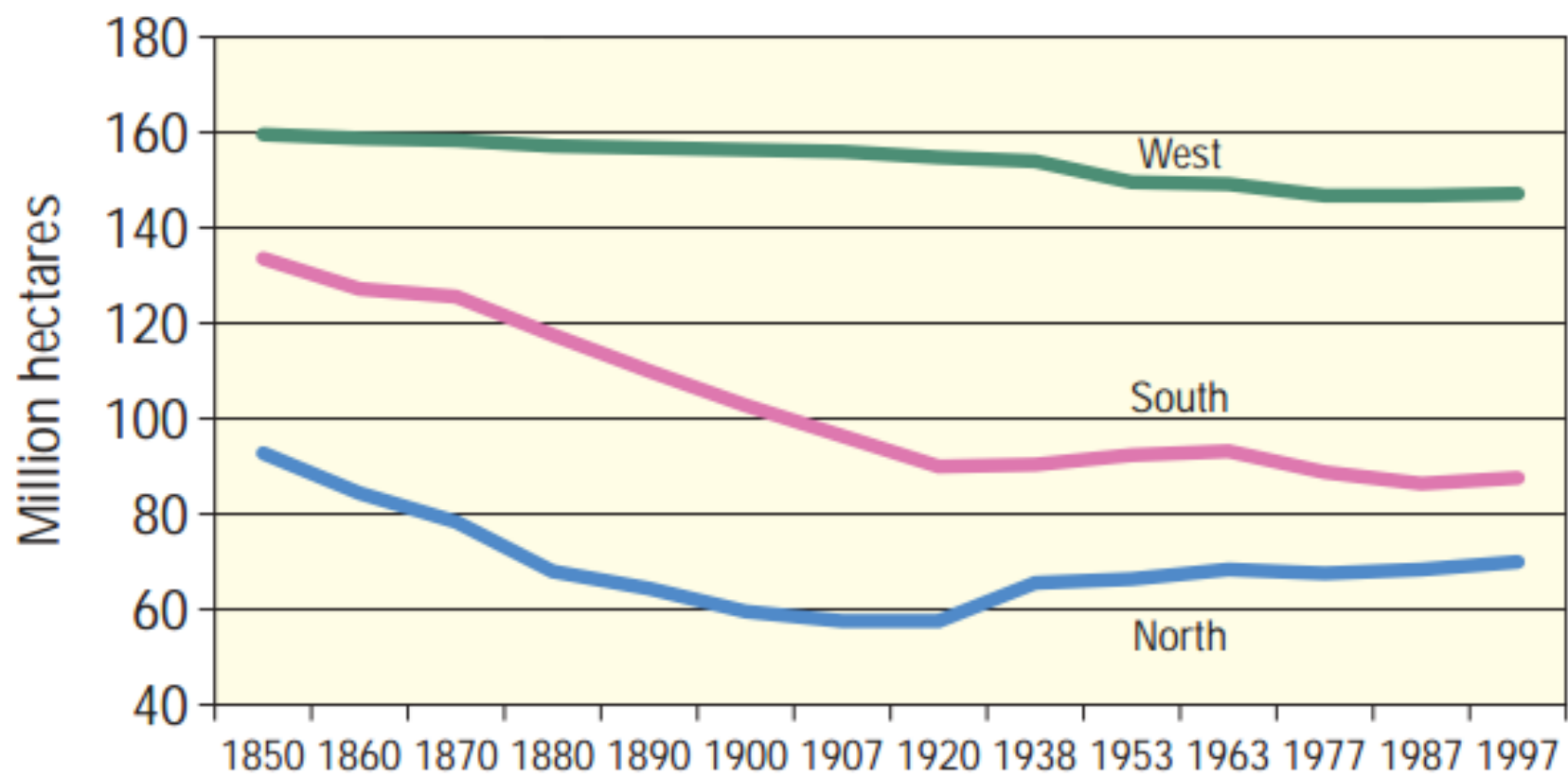


This geospatial dataset was created by the USFS Forest Inventory and Analysis (FIA) program and the Remote Sensing Applications Center (RSAC) to show the extent, distribution, and forest type composition of the nation's forests. The dataset was created by modeling forest type from FIA plot data as a function of more than one hundred geospatially continuous predictor layers. This process results in a view of forest type distribution in greater detail than is possible with the FIA plot data alone. Nearly one-half million FIA sample plots nationwide were used to develop these models. Among the predictor layers used were digital elevation models (DEM) and DEM derivatives; Moderate Resolution Spectroradiometer (MODIS) multi-date composites, vegetation indices and vegetation continuous fields; class summaries from the 1992 National Land Cover Dataset (NLCD); various ecologic zones; and summarized PRISM climate data.

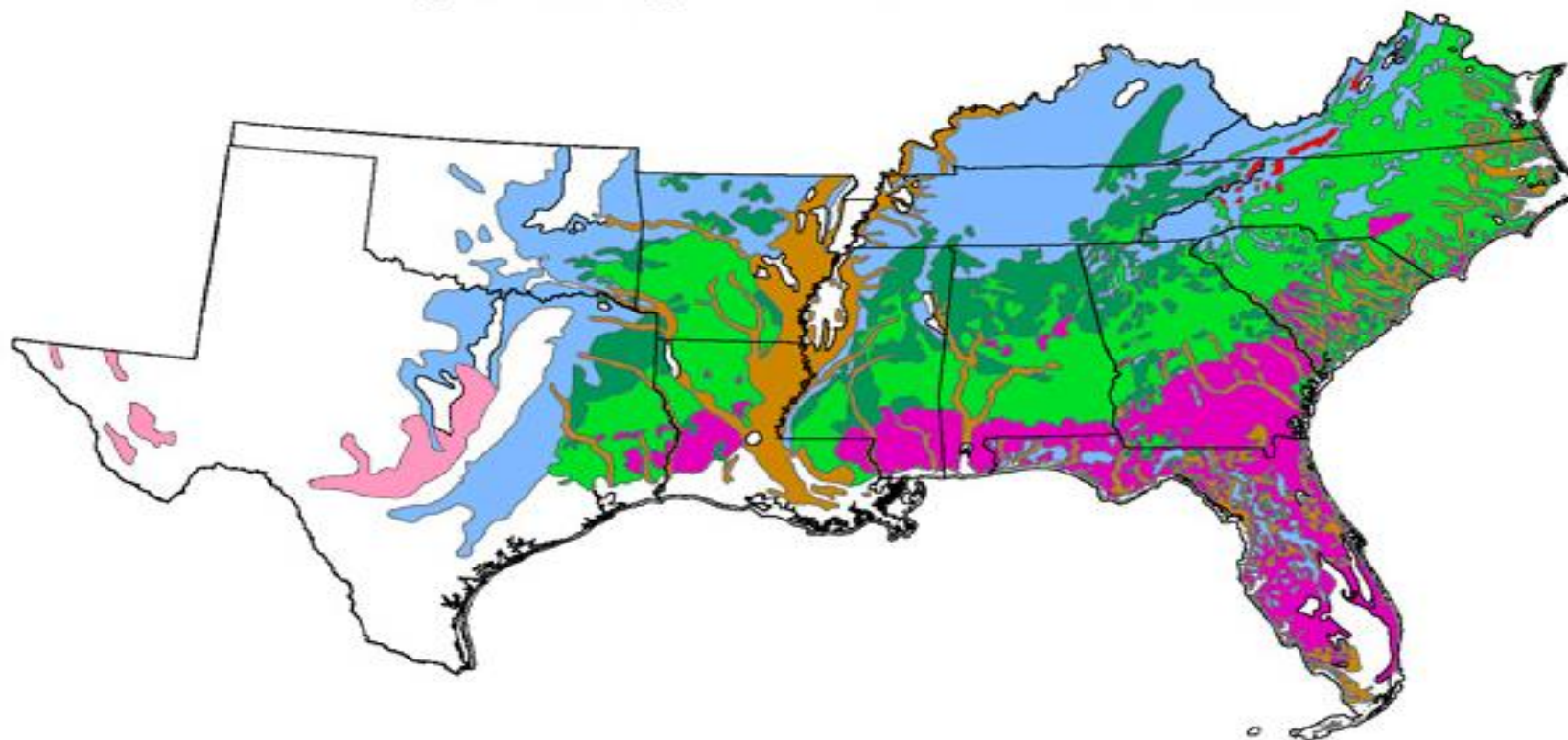
Modeling was performed using a data mining package, Cubit / SeeS, which was heavily coupled with Leticia Geosystems Imagine™ image processing software. One significant advantage of Cubit / SeeS is that it is a non-parametric modeler that assumes nothing about the structure of the input datasets and can incorporate both nominal, ordinal and ratio scale predictor data. Care should be taken when using all moderate resolution data in geospatial analyses. These data should only be used with data of similar scale and resolution.




Forest land trends in the United States, 1850-1997



Major Forest Types in the Southern United States

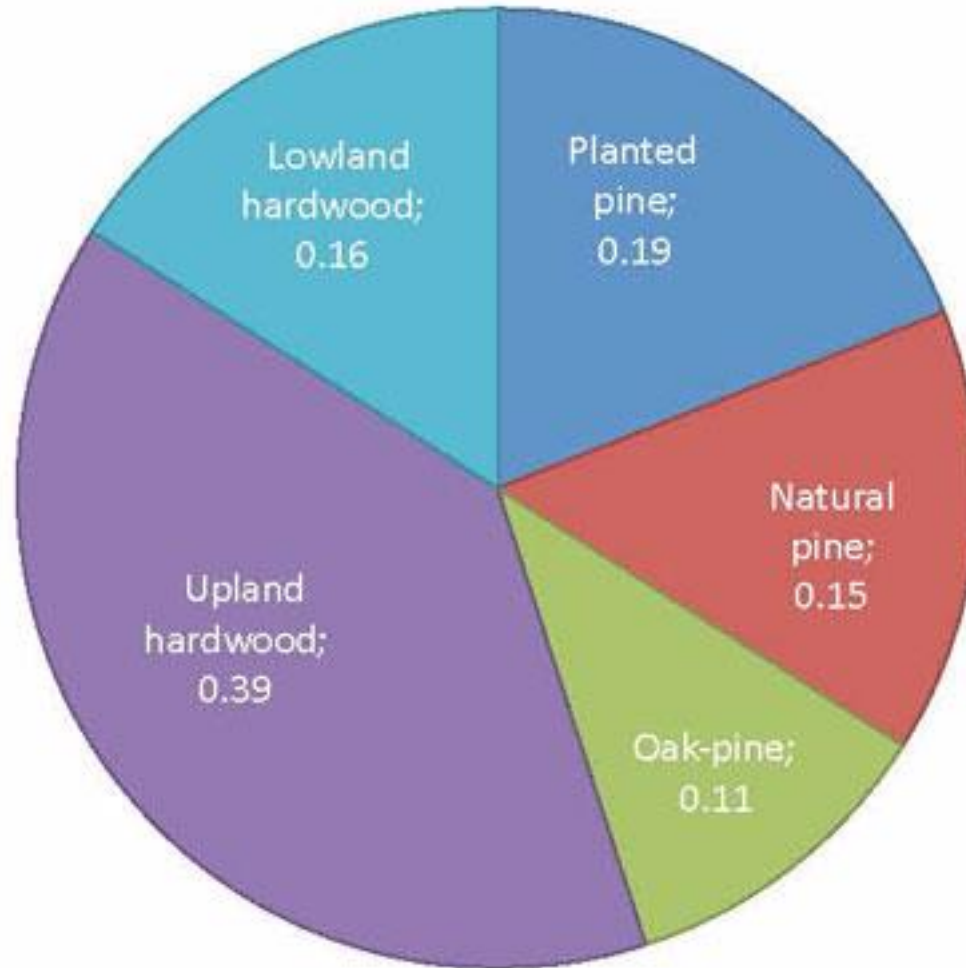


Forest Cover Types

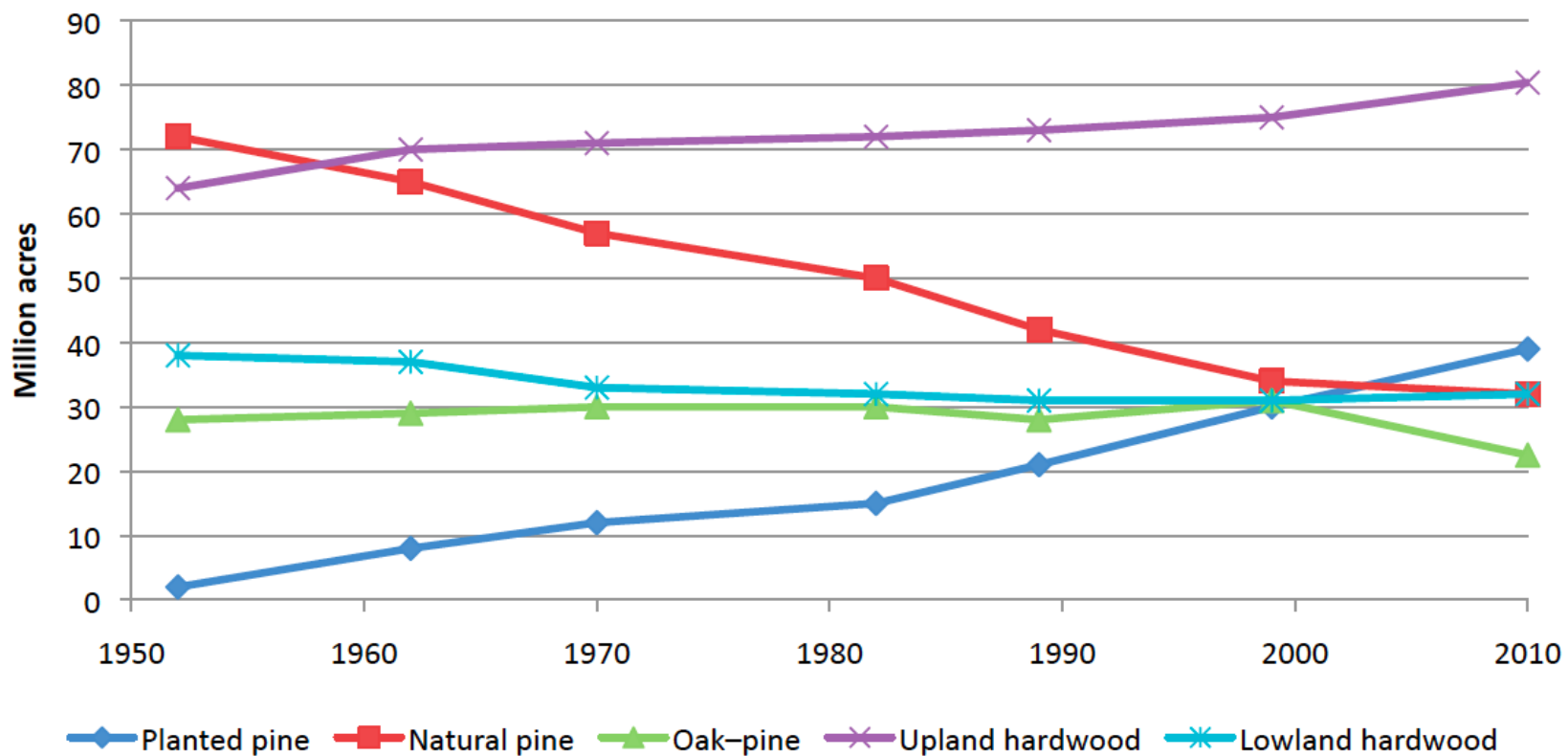
- | | |
|---|---|
|  White - Red - Jack Pine |  Oak - Hickory |
|  Longleaf - Slash Pine |  Oak - Gum - Cypress |
|  Loblolly - Shortleaf Pine |  Pinyon - Juniper |
|  Oak - Pine |  Non Forest Land |



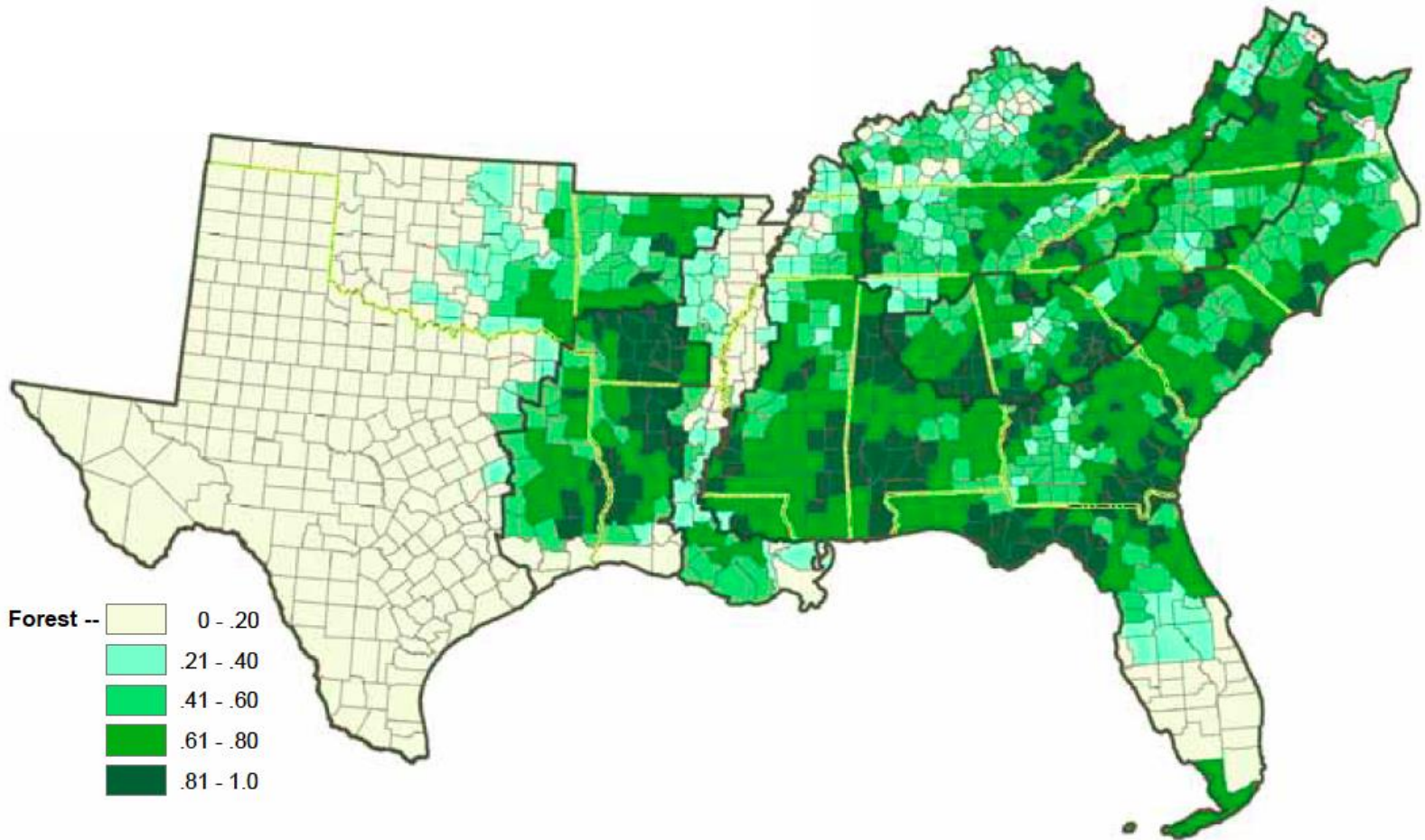
Distribution of broad forest cover type in the Southern United States 2010



Historical trends in forest area by broad forest management type, 2007

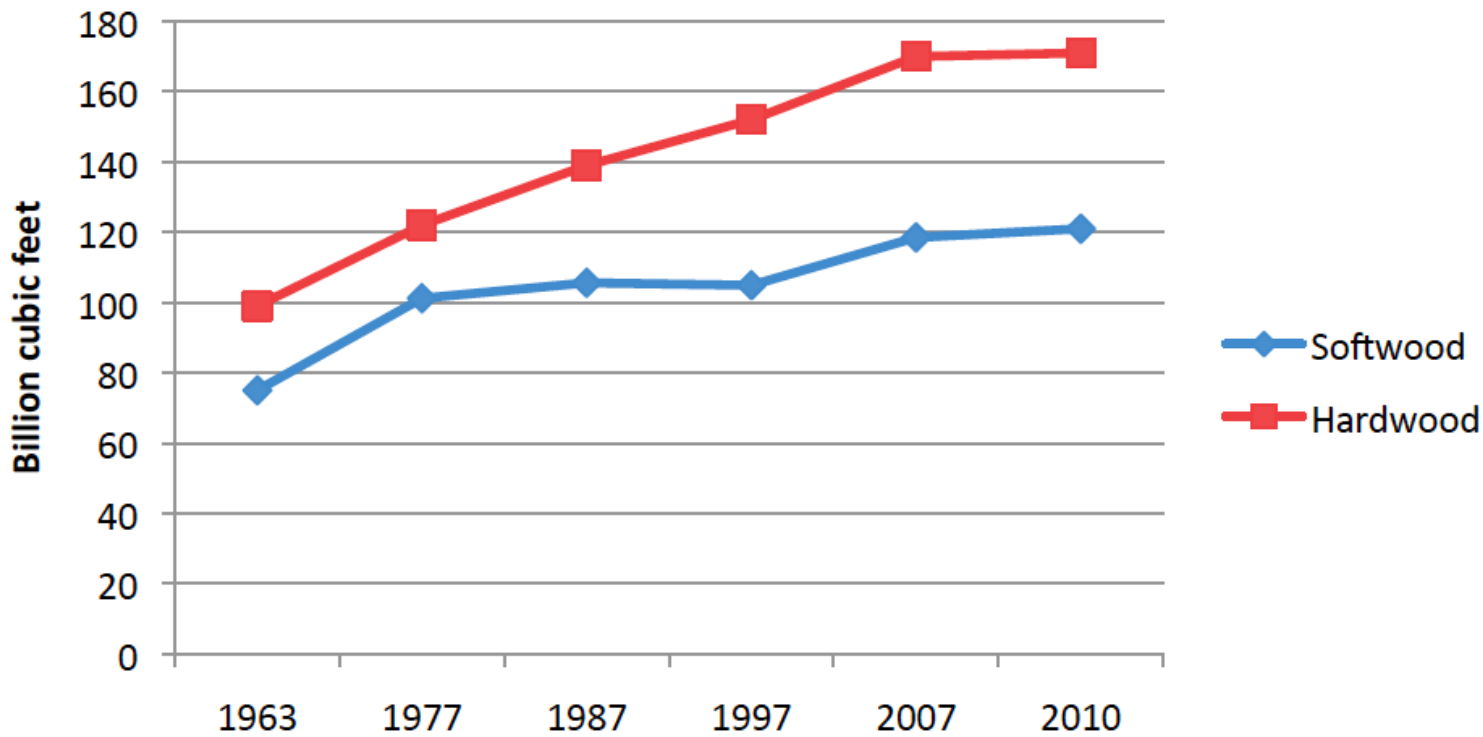


Proportion of county in forestland use (2009)



Source: USDA FS, 9/2013 (<http://fs.fed.us>)

Trends in standing biomass (growing stock inventory) 2009

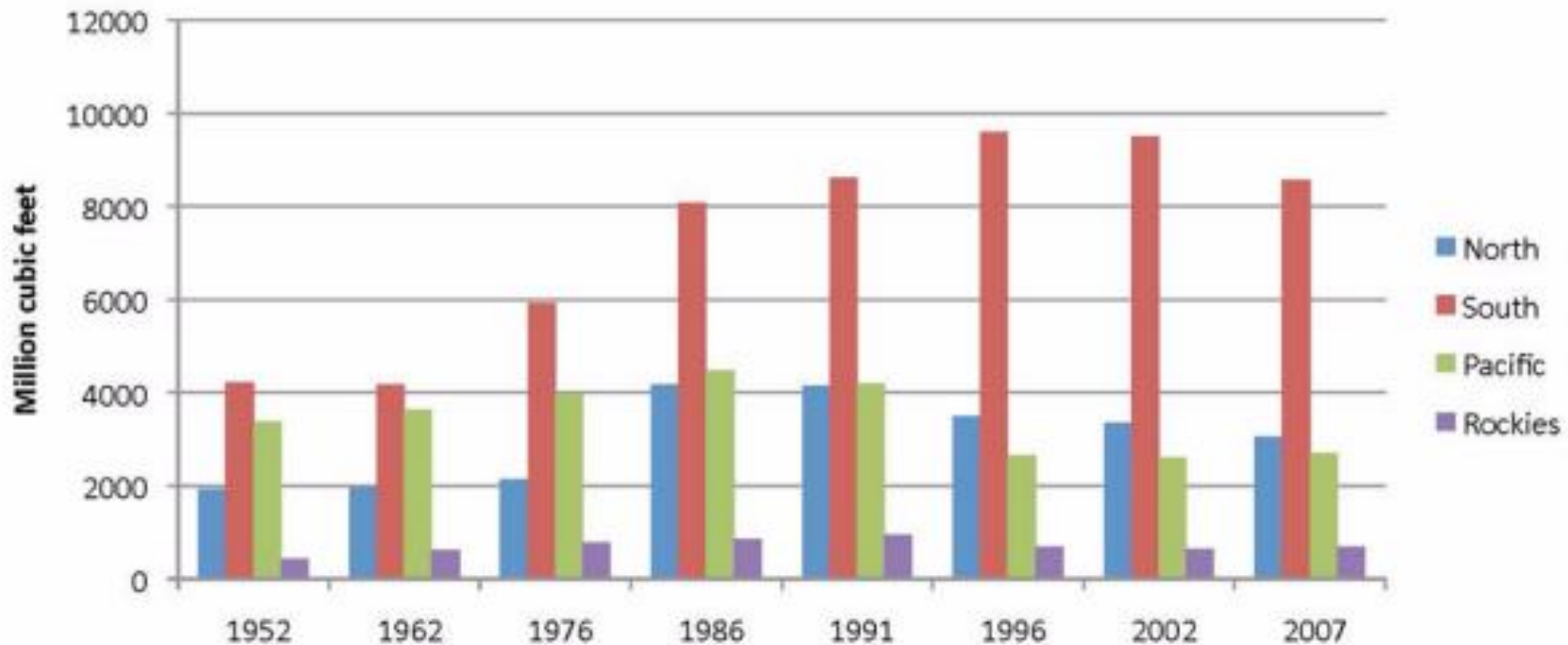


Most common forest products

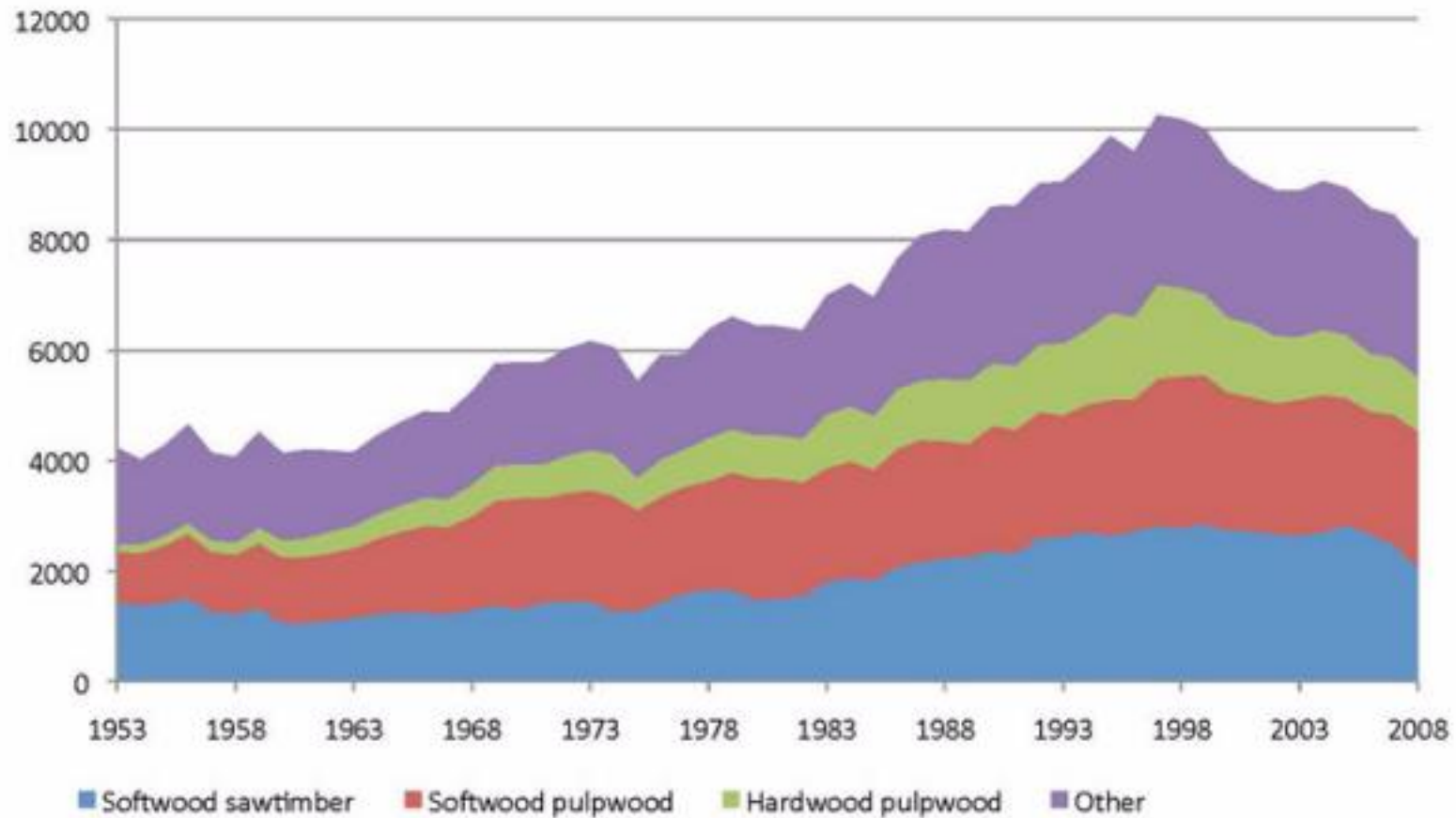
- Pulpwood
- “Super pulpwood”
- Chip n Saw
- Small sawtimber
- Large sawtimber
- Veneer
- Poles and Pilings
- Firewood



Timber harvest in the US by region



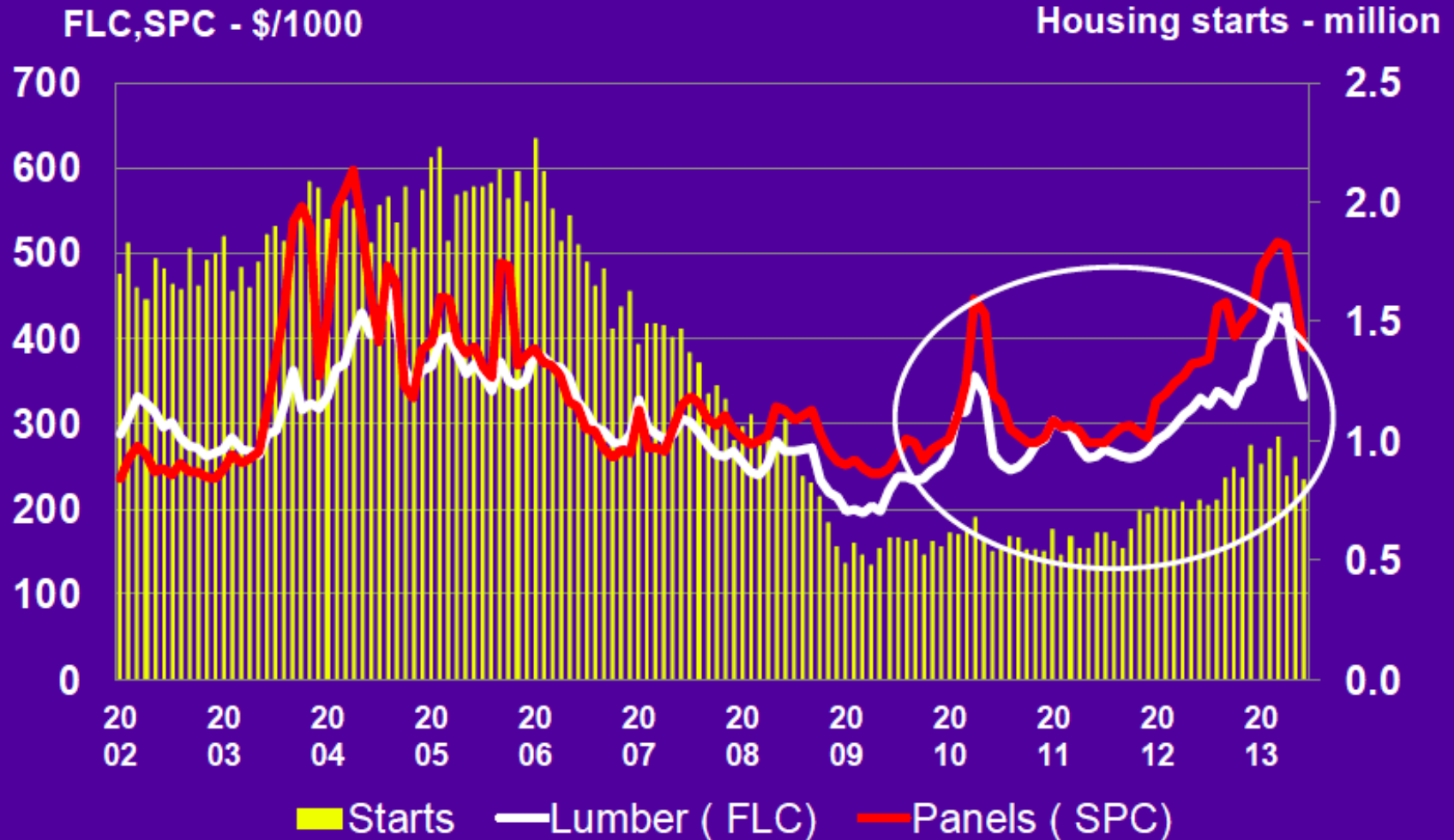
Roundwood production in the Southern United States (2010)



Housing starts and wood product prices – Economics 101

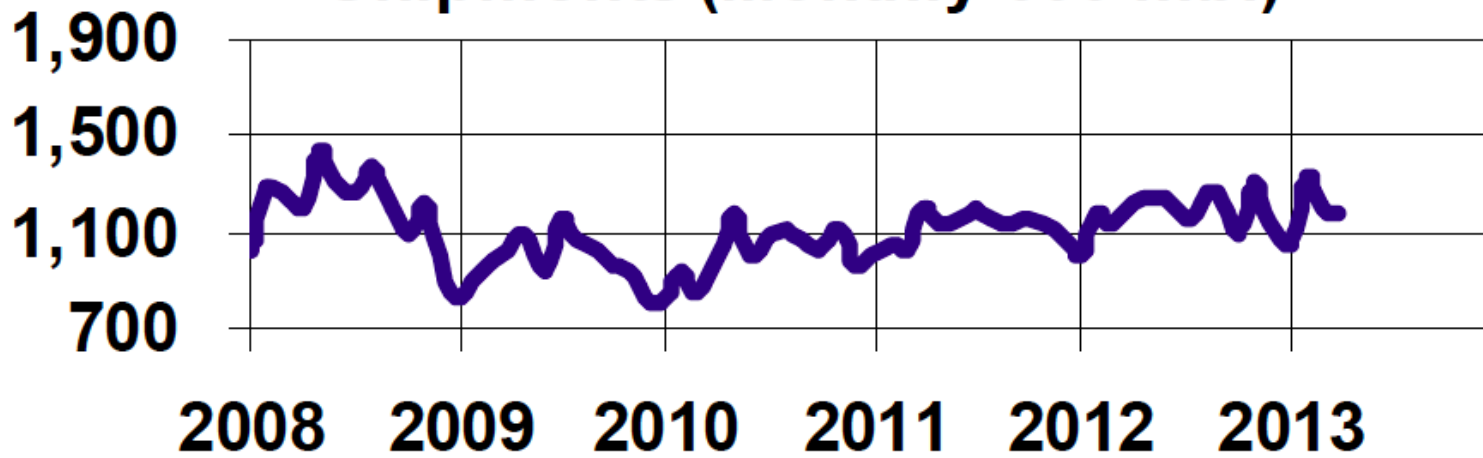
Following housing bust in 2008, wood prices fell and production capacity was reduced.

So, when housing starts increased, there was an imbalance between demand and supply of wood products. The price mechanism brings demand and supply into balance. Initially, prices fell almost 50% - this instigated production cutbacks of 50% or more - then, as housing begins to turn around, prices increase - this encourages Production increases for wood products - and the cycle starts over.

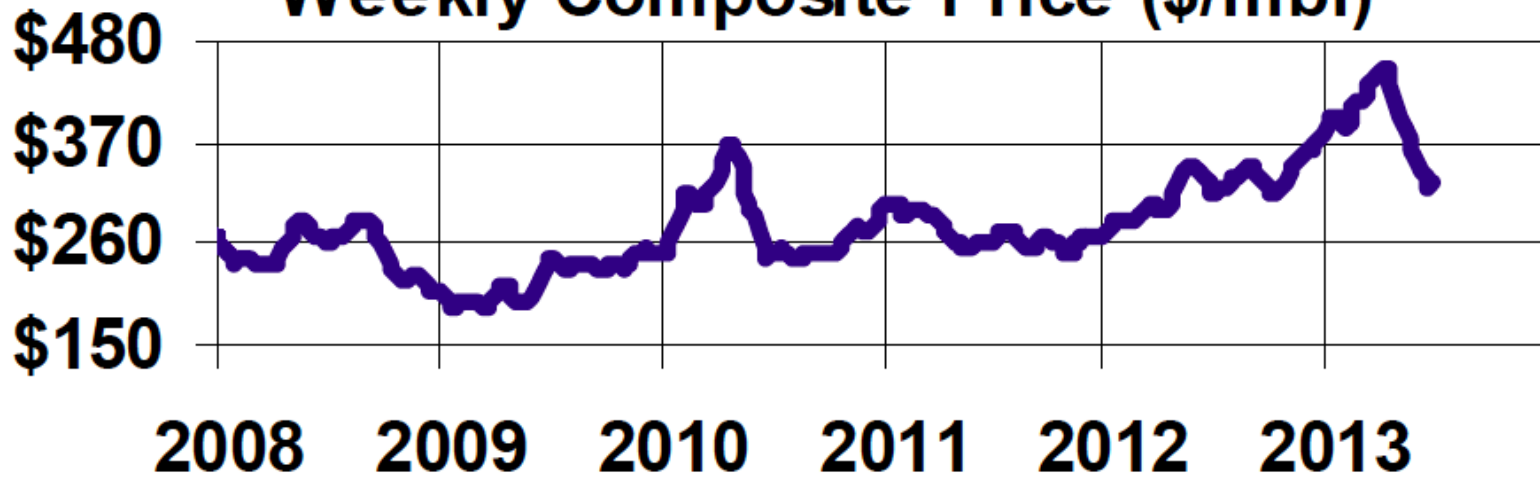


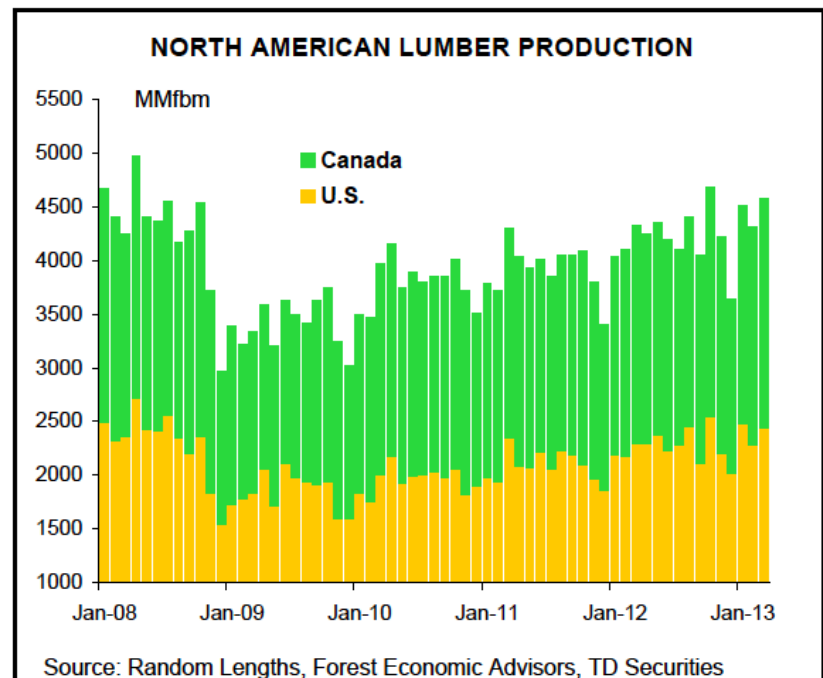
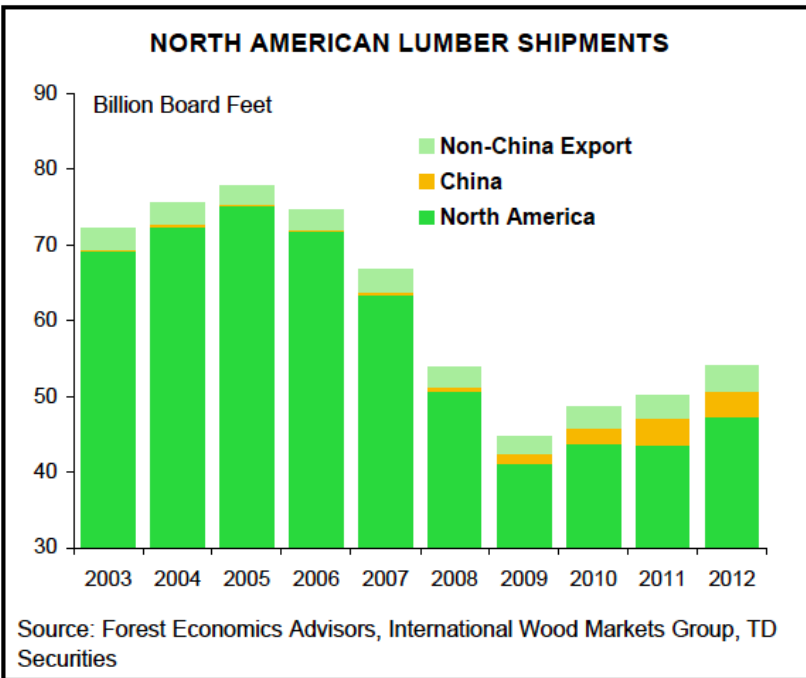
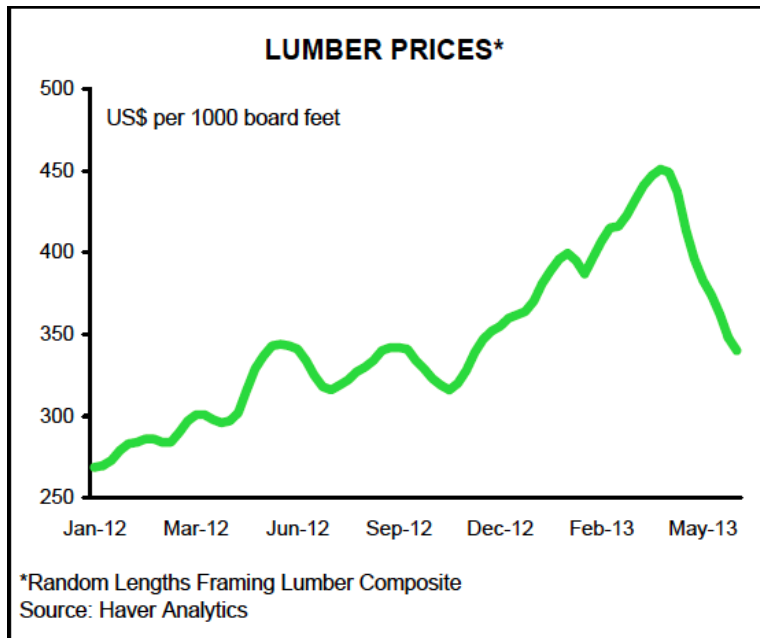
Sources: Prices – Random Lengths (<http://www.randomlengths.com/>); starts (Bureau of Census (<http://www.census.gov/construction/nrc/>))

SFPA US South Pine Lumber Shipments (Monthly 000 mbf)

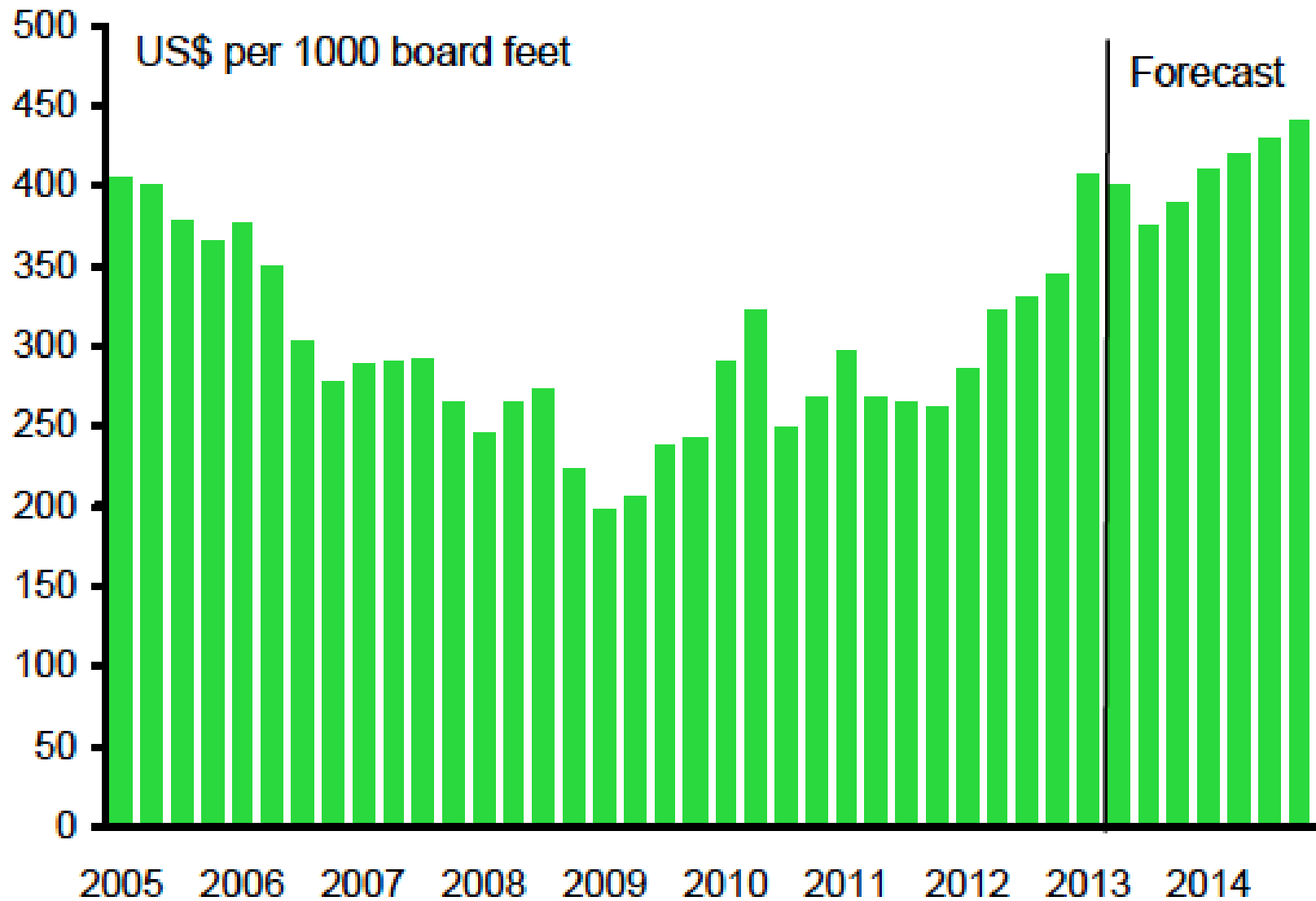


Random Lengths Framing Lumber Weekly Composite Price (\$/mbf)





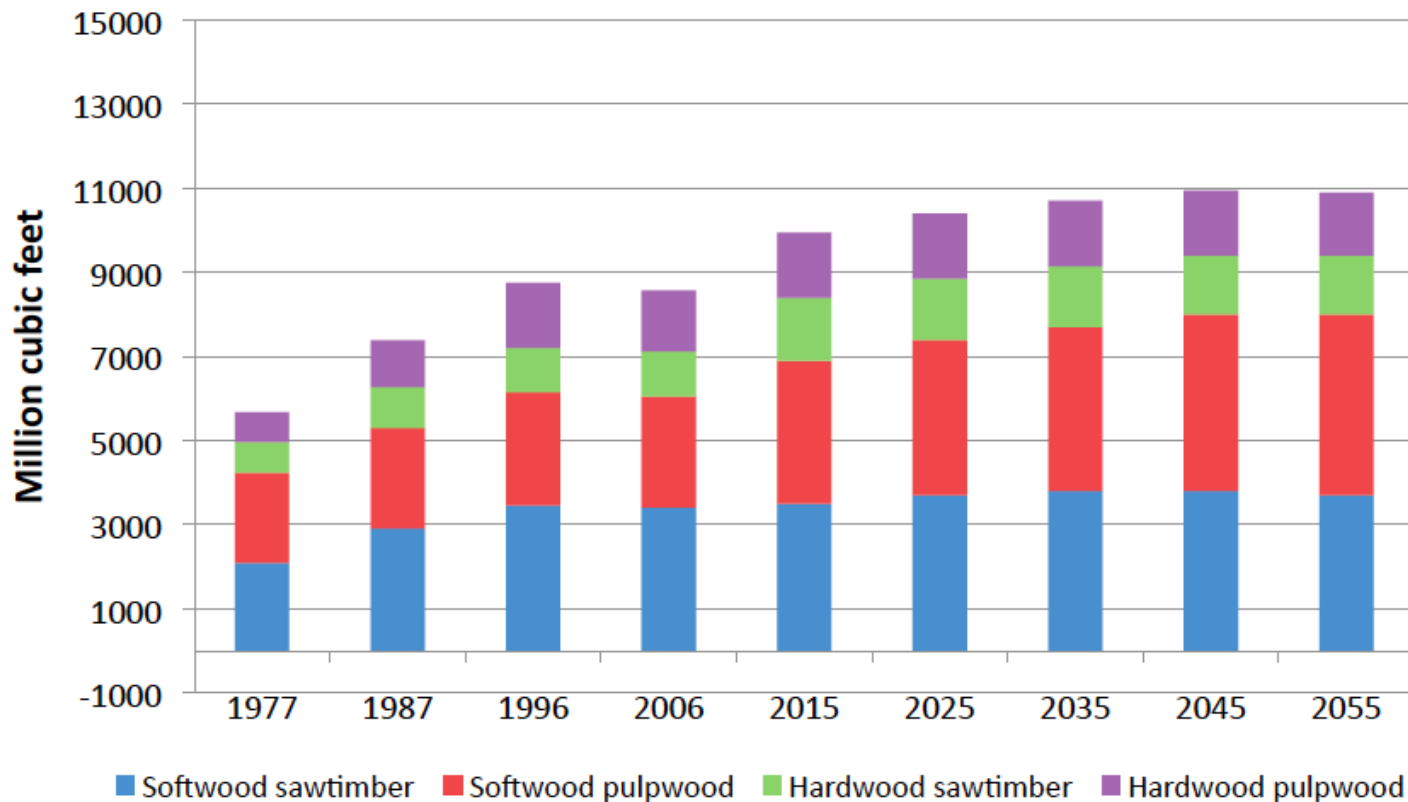
LUMBER PRICE* FORECAST



*Random Lengths Framing Lumber Composite

Source: Haver Analytics. Forecast by TD Economics as at June 2013

Forecast of timber harvest quantities assuming high population/income growth



USDA Forest Service Southern Research Station

SRS HQ

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Economic Impacts of Wood Related Sectors in the US South

Introduction

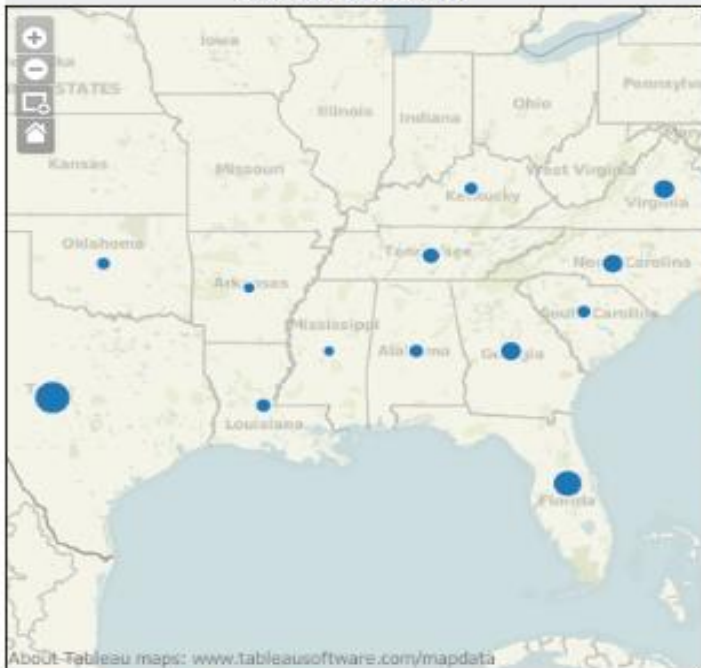
Wood-related industries contribute to the economy of all 13 southern states, to varying degrees. The wood-related industries include the forestry and logging sector, the wood-products manufacturing sector, the paper manufacturing sector, and the furniture manufacturing sector. Using a combination of data from the Bureau of Economic Analysis and results from an input-output model (IMPLAN), we have prepared a website that allows users to see and compare annual trends by state and industry by using Tableau software 'visualizations'. These visualizations include income and jobs for each of the states and industries from 1990 to 2011, and also include the total contribution of the industries to the state economies from the input-output modeling. This information is of specific interest to state forestry agencies as they promote forests and wood processing in their states.

Use the links below to find out more about the economic impact that the various wood-related industries have on the state economies of the US south. The wood-related industries include the forestry and logging sector (NAICS 113), the wood-products manufacturing sector (NAICS 321), the paper manufacturing sector (NAICS 322), and the furniture manufacturing sector (NAICS 337). For information about how we aggregated these sectors, please see this [spreadsheet](#).

- [Role of wood related industries in state economies, 2011](#)
- [Wood related industries over time by state, 1990-2011](#)
- [Comparison of all wood related industries over time, by industry and by state, 1990-2011](#)
- [Contribution of wood related industries to states, 2009-2010](#)
- [Source data](#)

Comparison of All Major Industries

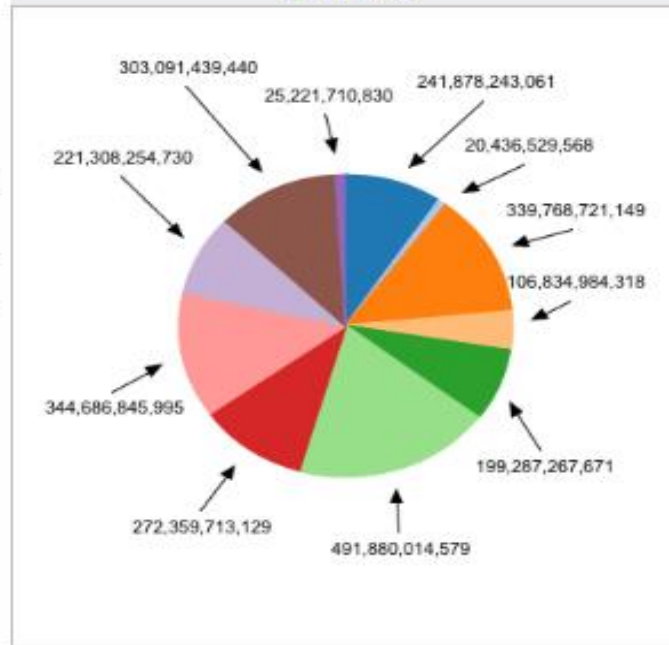
Select Your State(s)



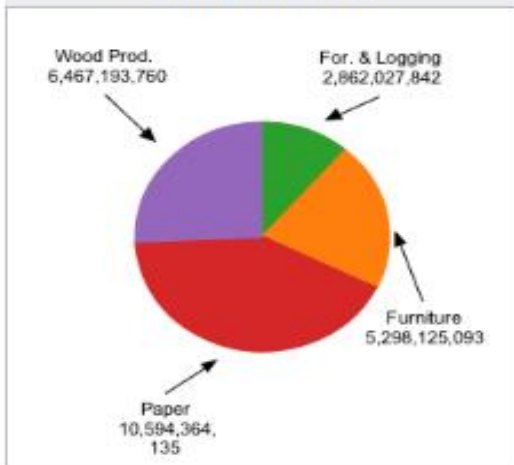
Unit
 ● Employment
 ● Income

- Industries
- Admin. and Educ.
 - Agriculture
 - Const., Mining, ...
 - Entertainment
 - Fin., Ins., and ...
 - Government
 - Health
 - Info. and Prof.
 - Manufacturing
 - Trade
 - Wood Related

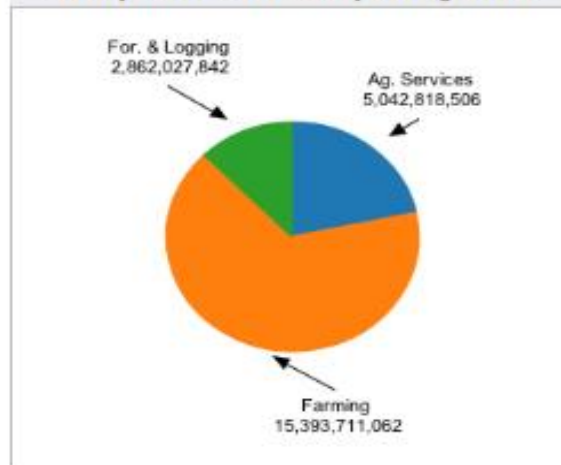
All Industries



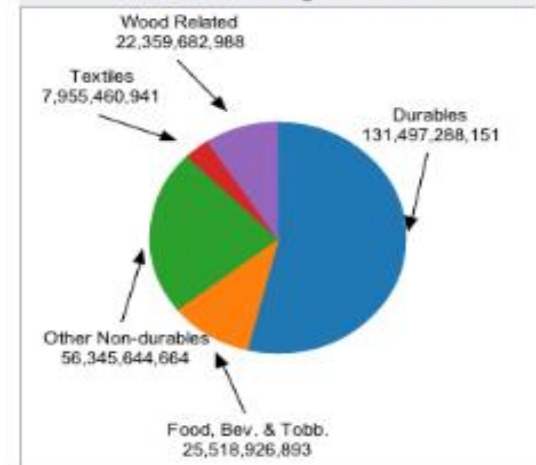
Wood Related Industries



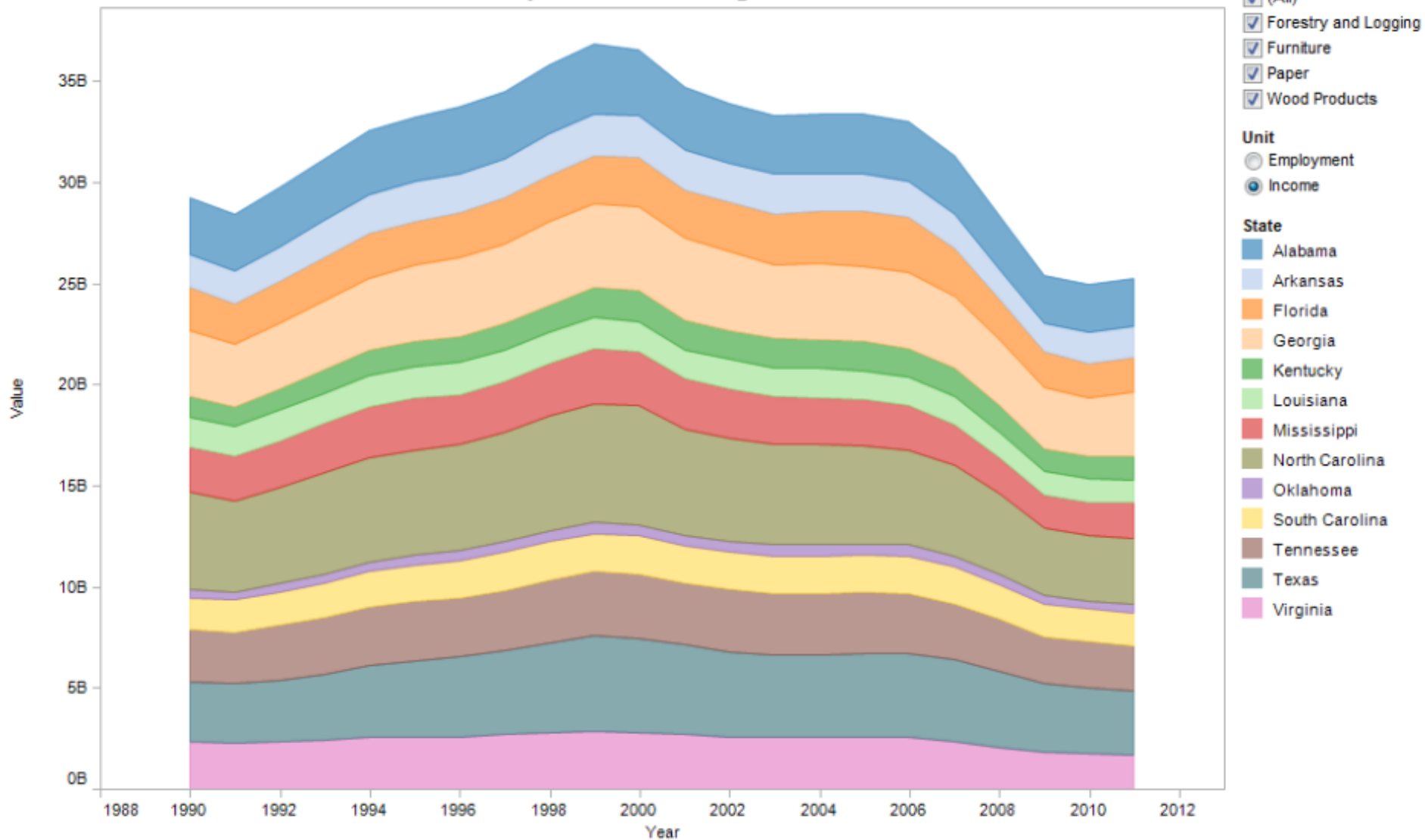
Primary Production: Forestry and Agriculture



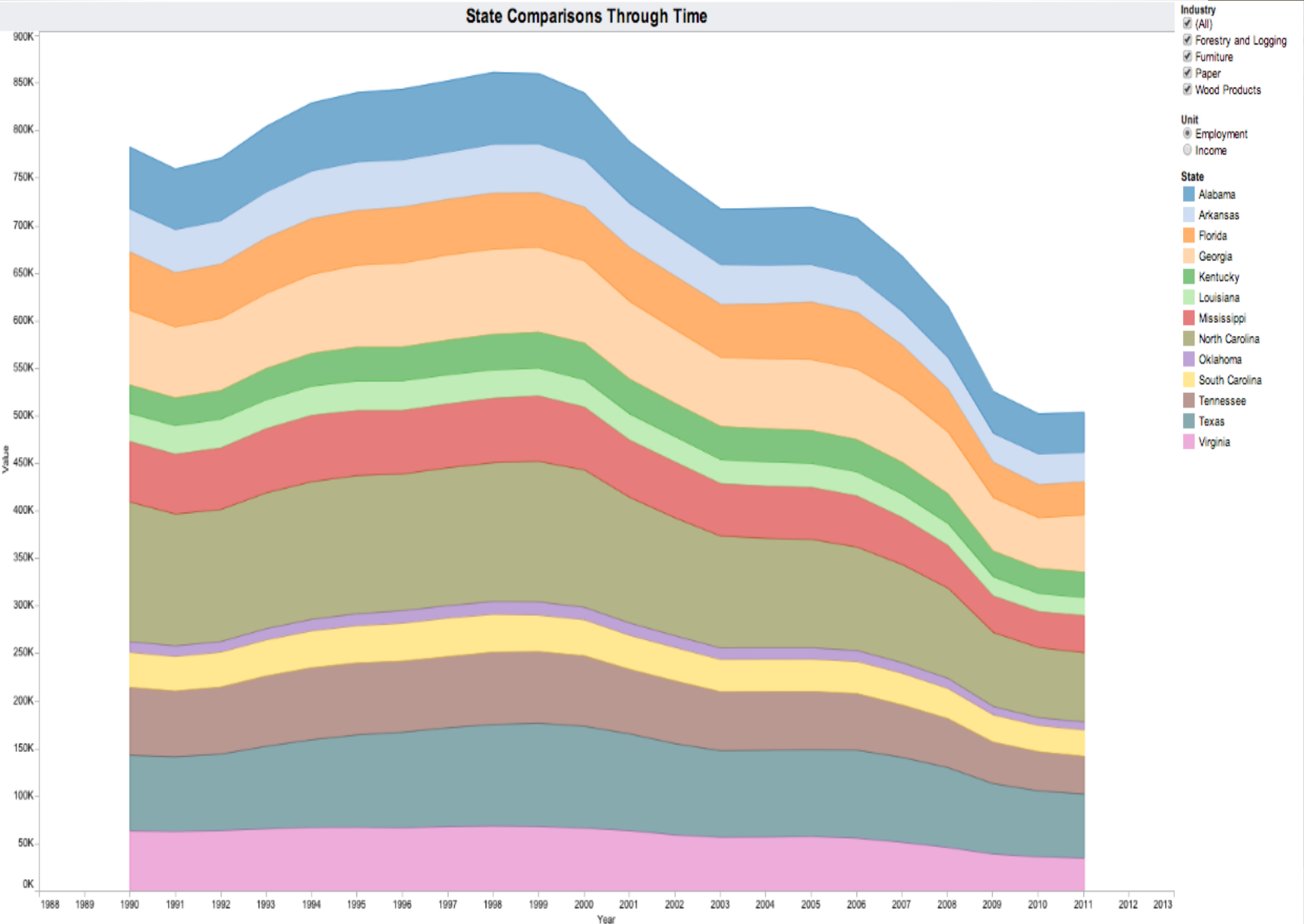
All Manufacturing Industries



State Comparisons Through Time

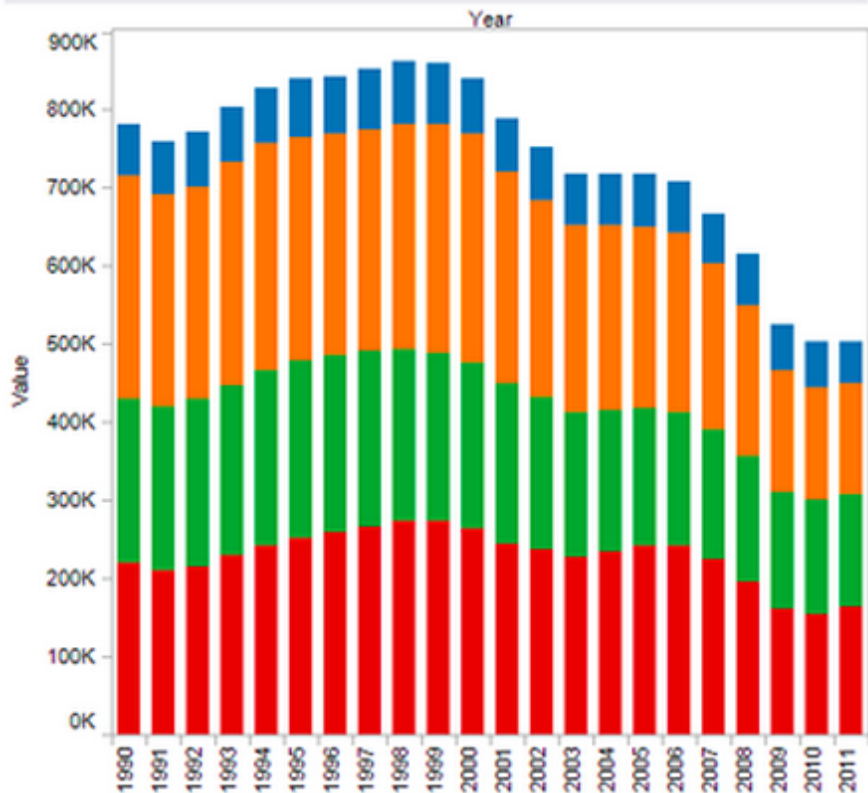


State Comparisons Through Time

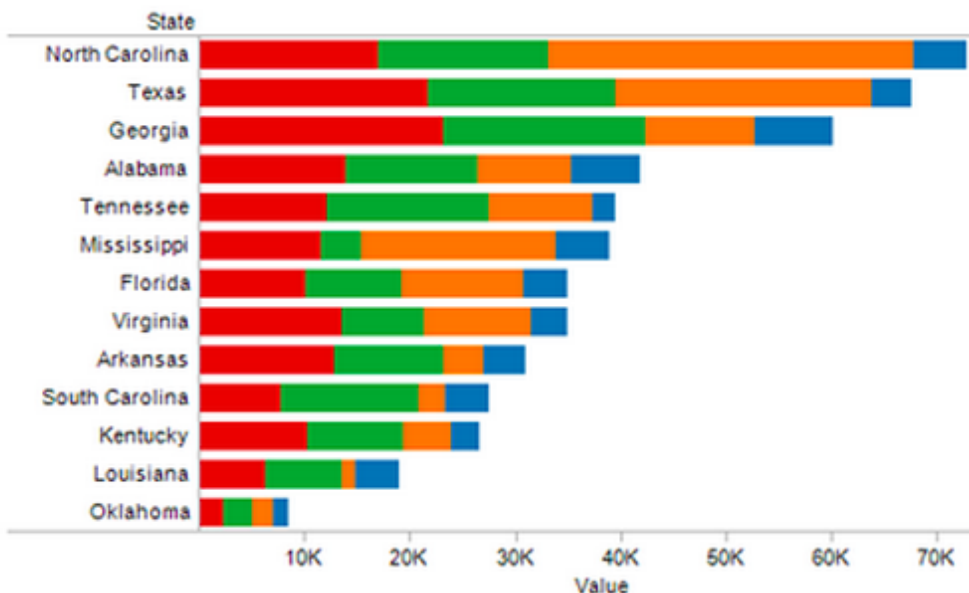


Wood Related Industries Comparisons

Full Timeseries - Select Area Below



Yearly Snapshot



State

- (All)
- Alabama
- Arkansas
- Florida
- Georgia
- Kentucky
- Louisiana
- Mississippi
- North Carolina
- Oklahoma
- South Carolina
- Tennessee
- Texas
- Virginia

Unit

- Employment
- Income

Industry

- (All)
- Forestry and Logging
- Furniture
- Paper
- Wood Products

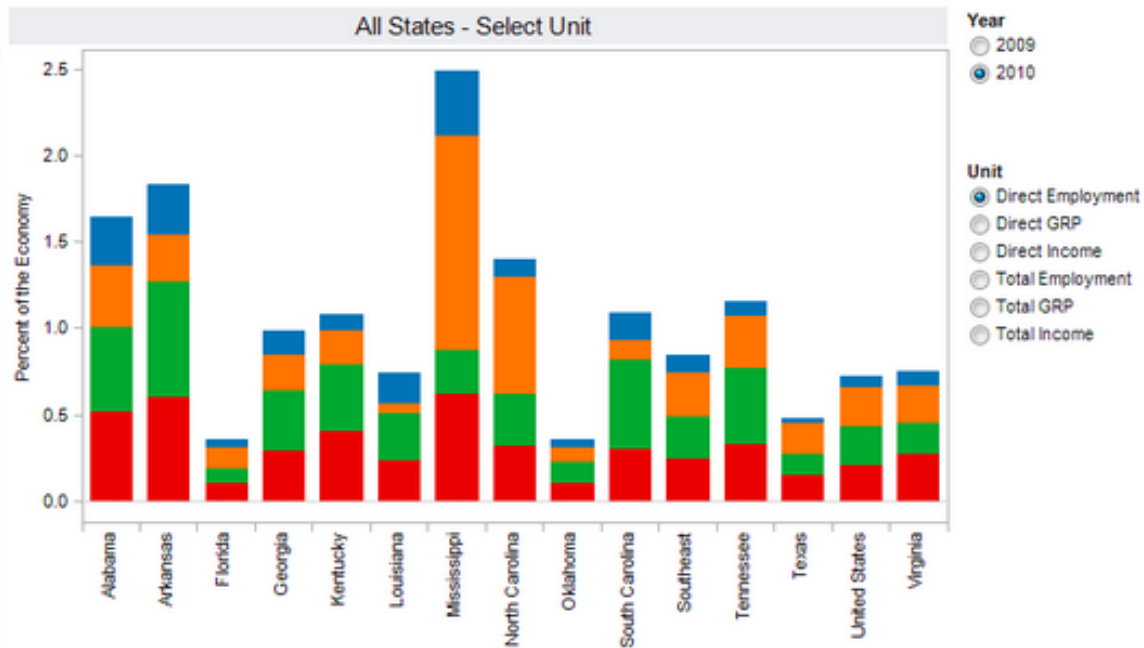
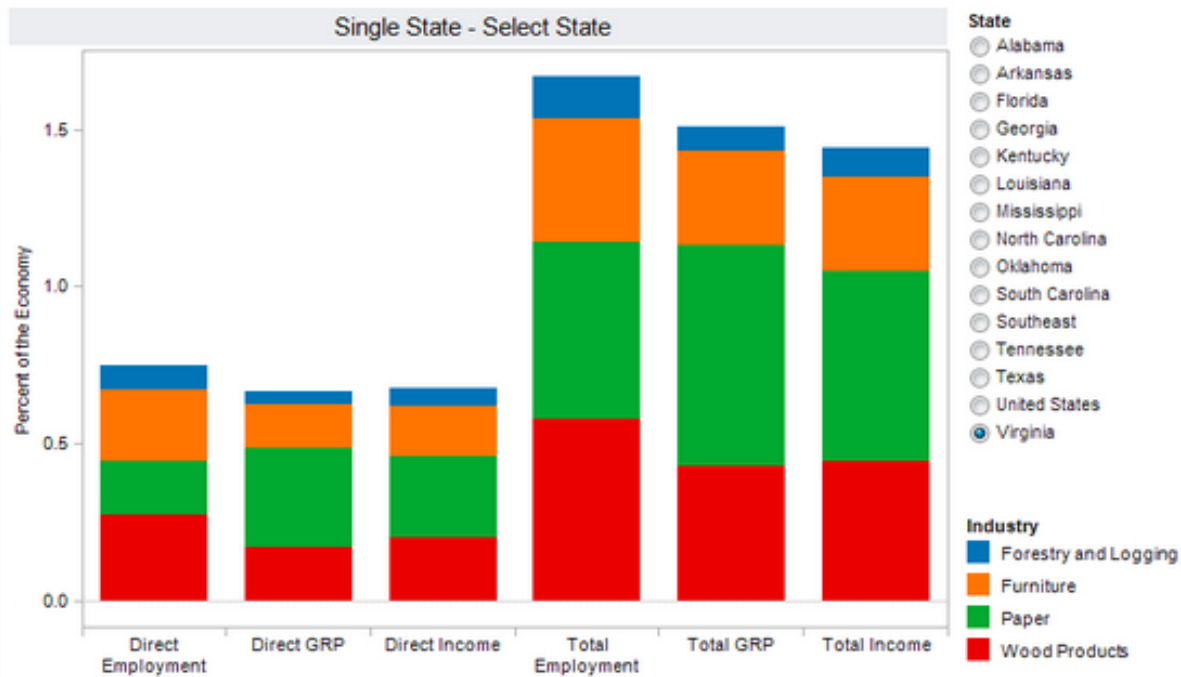
Industry

- Forestry and Logging
- Furniture
- Paper
- Wood Products

Year

2011

Direct and Total Effects of Wood Related Sectors



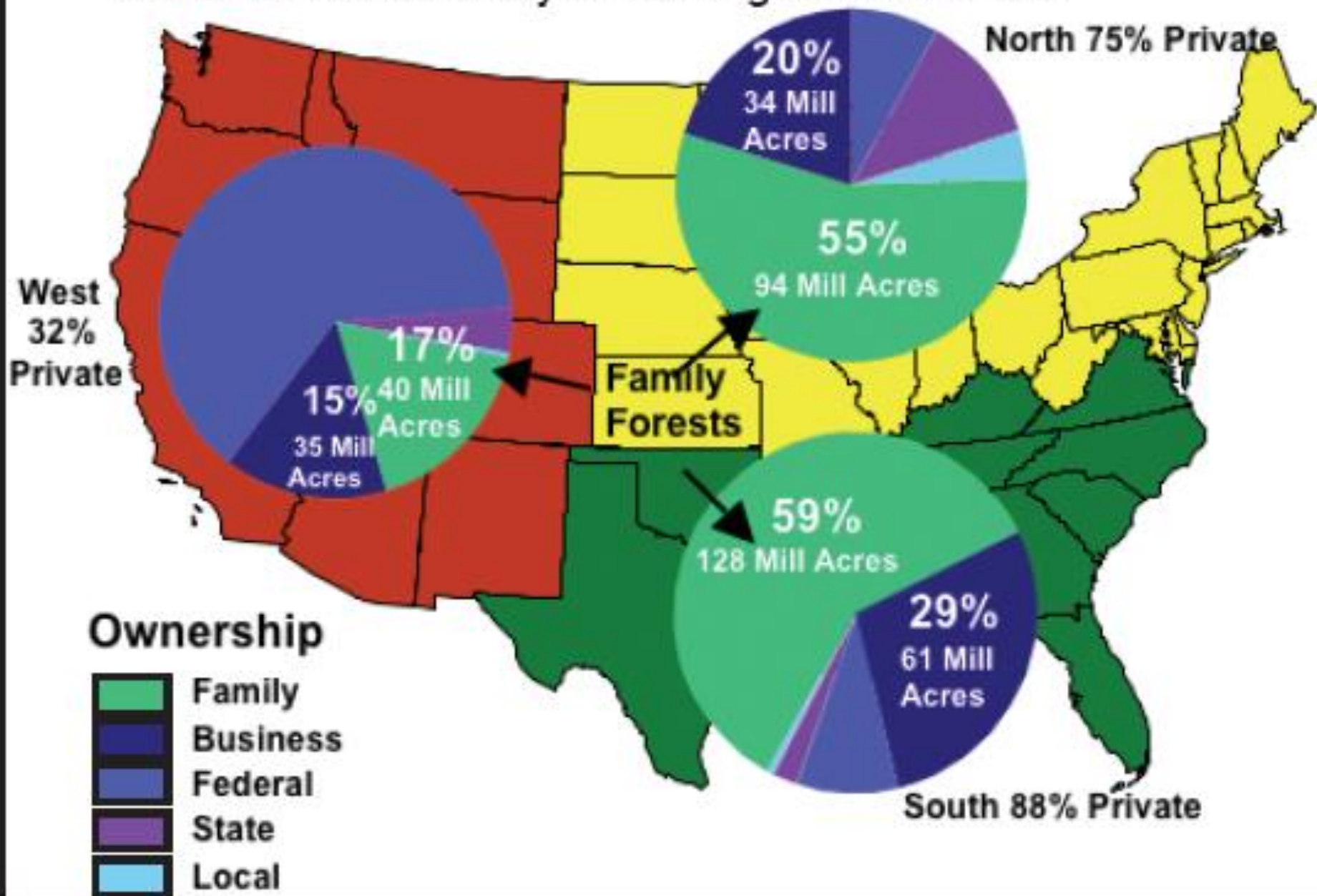
Markets for southern timber products

- Although timber production in the South more than doubled from the 1960s to the late 1990s, output levels have declined over the last 10 years, signaling structural changes in timber markets.
- As demand receded, investment in softwood production continued to expand, leading to increased supply for softwoods, especially softwood pulpwood. The net result was a substantial reduction in softwood pulpwood prices.
- Forecasts of timber markets show an increasing supply of softwood timber, especially softwood pulpwood, as new plantations mature and additional plantations accumulate across the South; softwood pulpwood supply increases throughout the next 40 years, and softwood sawtimber supply increases over the next decade and then stabilizes.
- Forecasts of hardwood supply indicate a gradual contraction as urbanization shrinks inventories. If timber product demand remains at 2006 levels, total timber production is forecasted to increase by about 25 percent over the next 50 years, with a 50-percent price decrease for softwood pulpwood and little change in price for softwood sawtimber and hardwood pulpwood.

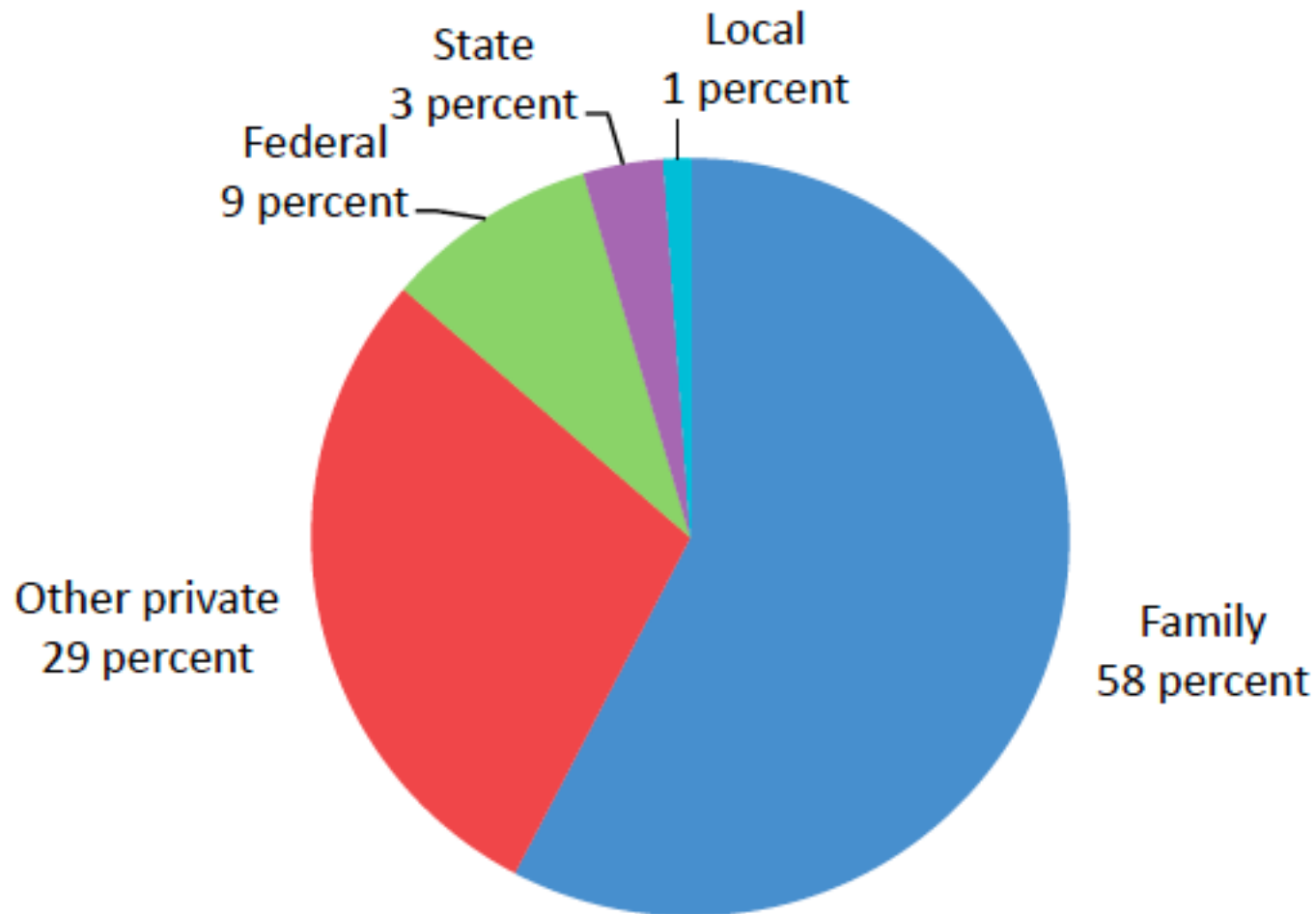
Markets for southern timber products

- If timber product demand returns to the growth levels of the 1980s and 1990s, total timber production is forecasted to increase by about 40 percent over the next 50 years, with the greatest gains in softwood pulpwood output; softwood pulpwood prices would stabilize at 2006 levels, and softwood-sawtimber and hardwood-pulpwood prices would increase by slightly less than 1 percent per year.
- If timber product demand increases and planted pine forests become more productive, total timber production is forecasted to increase by about 70 percent, with production of softwood pulpwood more than tripling; price stabilizes for softwood sawtimber, decreases less than 1 percent per year for softwood pulpwood, and increases less than 1 percent per year for hardwood pulpwood.
- Forecasts indicate that the region's timber supply could expand if moderate rates of future forest investments are added to investments in forests made over the past 20 years. Forecasts for 2055 show that annual production of softwood pulpwood could increase beyond 2006 levels by an additional 2.4 billion to 3.7 billion cubic feet (36.6 million to 57.9 million green tons) without substantial price effects.
- Without an expansion in timber demand, the private forest landowners would be expected to eventually experience a strong shift away from forest management as investment returns diminish to the point where continued investments could not be justified.

Individuals and families own more forest land in the South than in any other region of the U.S.²⁶



Distribution of southern forest ownership in the Southern United States, 2006



Area and owners of private forests: A Contrasting Story

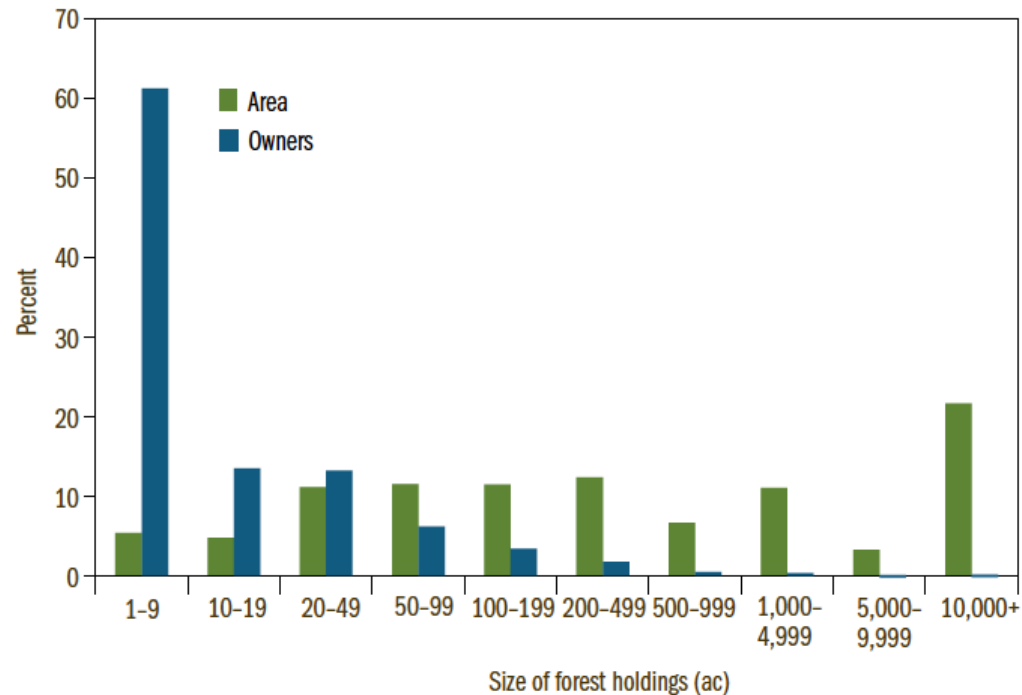


Figure 2c.3. Area and numbers of private of forests in the United States by size of forest holdings, 2006 (excluding interior Alaska, Hawaii, Nevada, western Texas, and western Oklahoma, due to lack of data).

Landowner objectives: Not exactly financial!

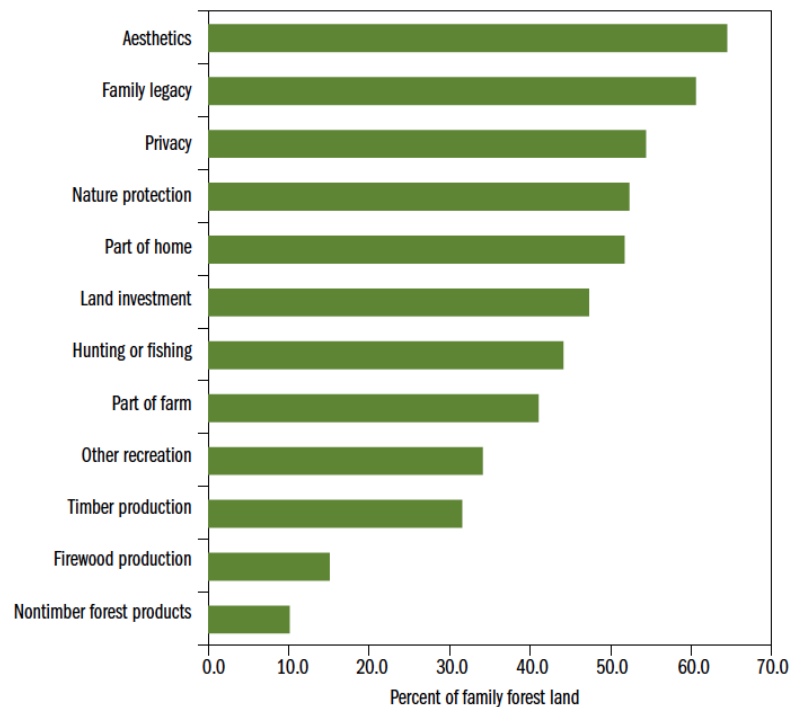
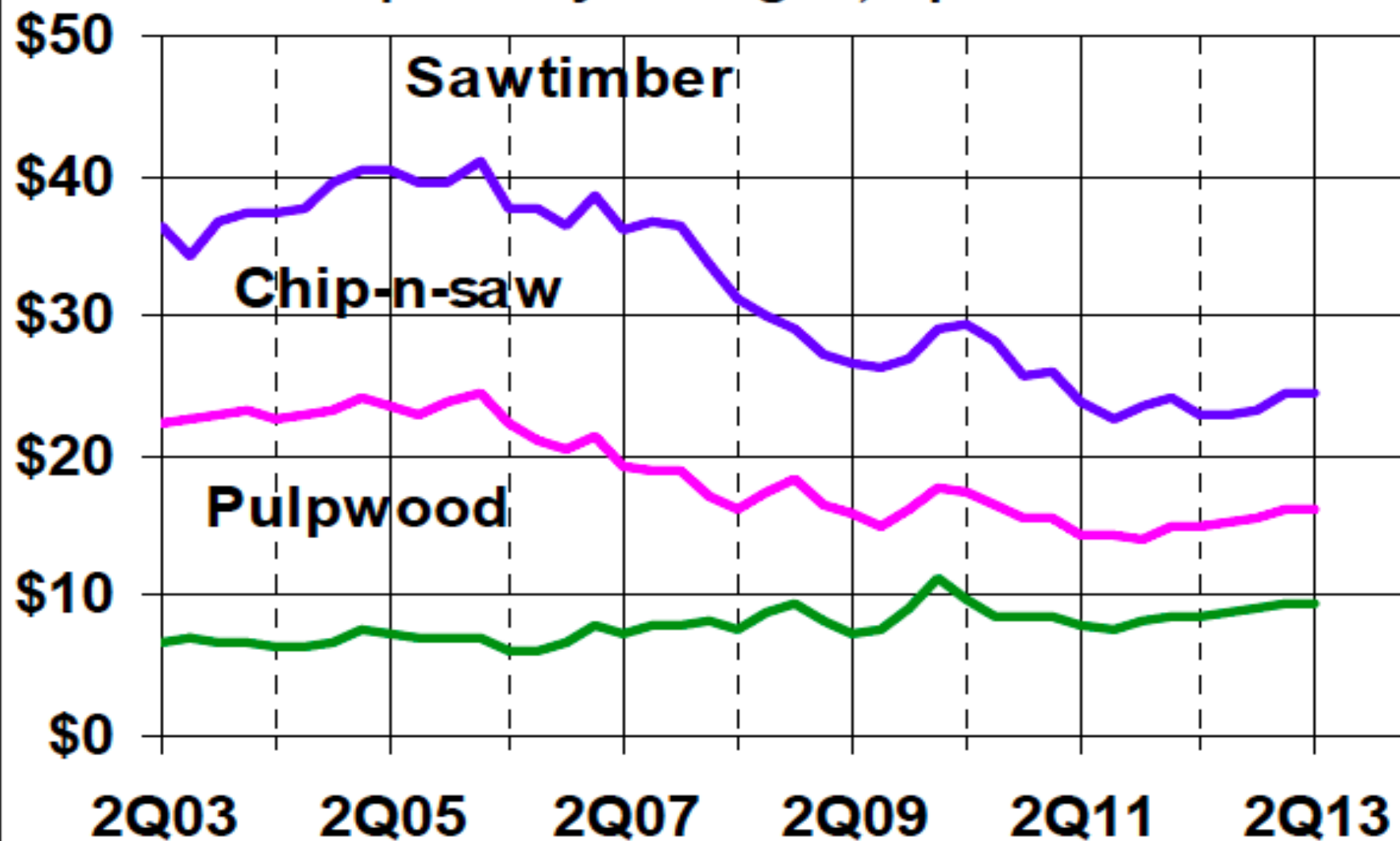


Figure 2c.4. Percentage of family forest land in the United States by reasons for owning, 2006.

South-wide Pine Stumpage Prices

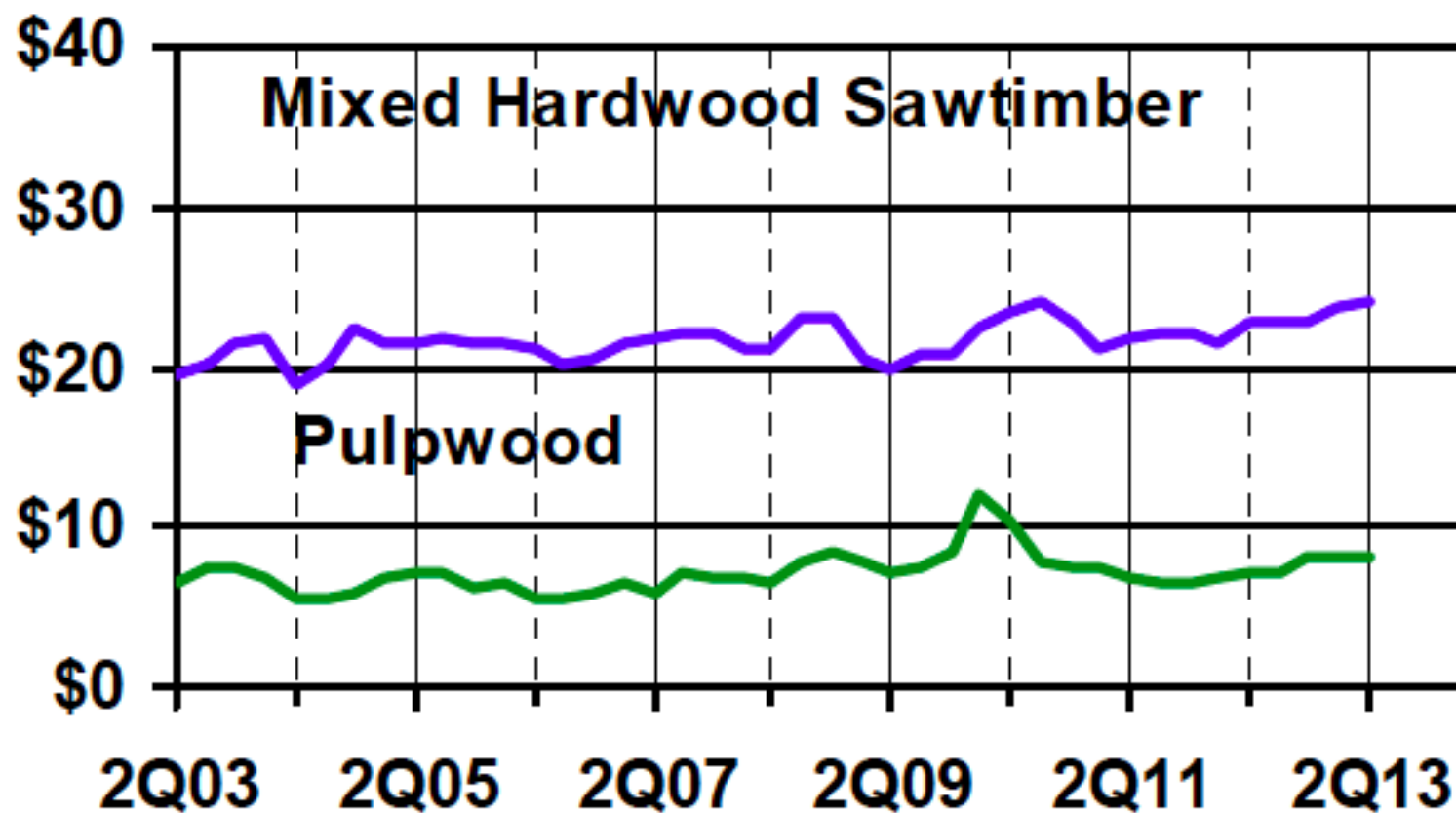
quarterly averages, \$ per ton



Timber Mart-South

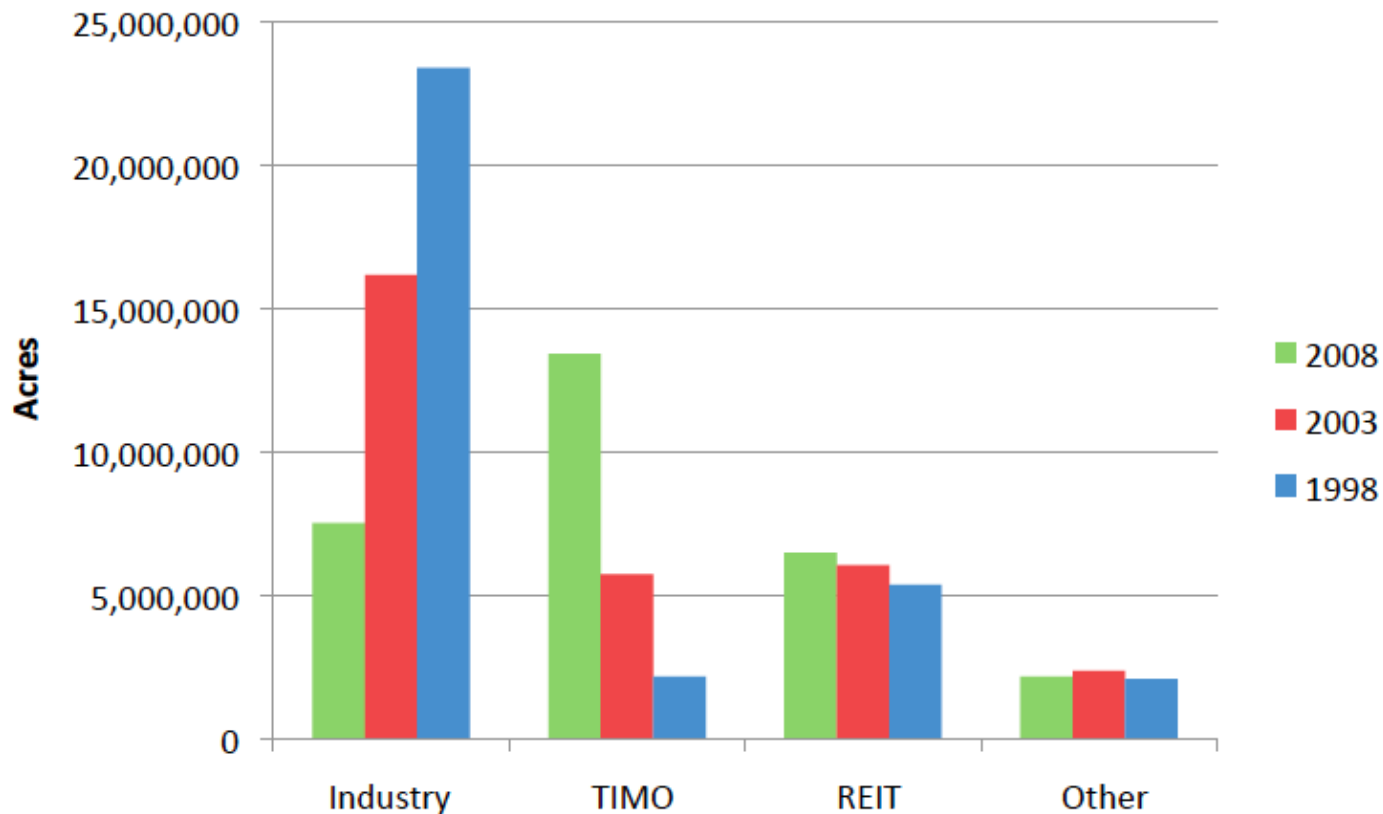
South-wide Hardwood Stumpage Prices

quarterly averages, \$ per ton

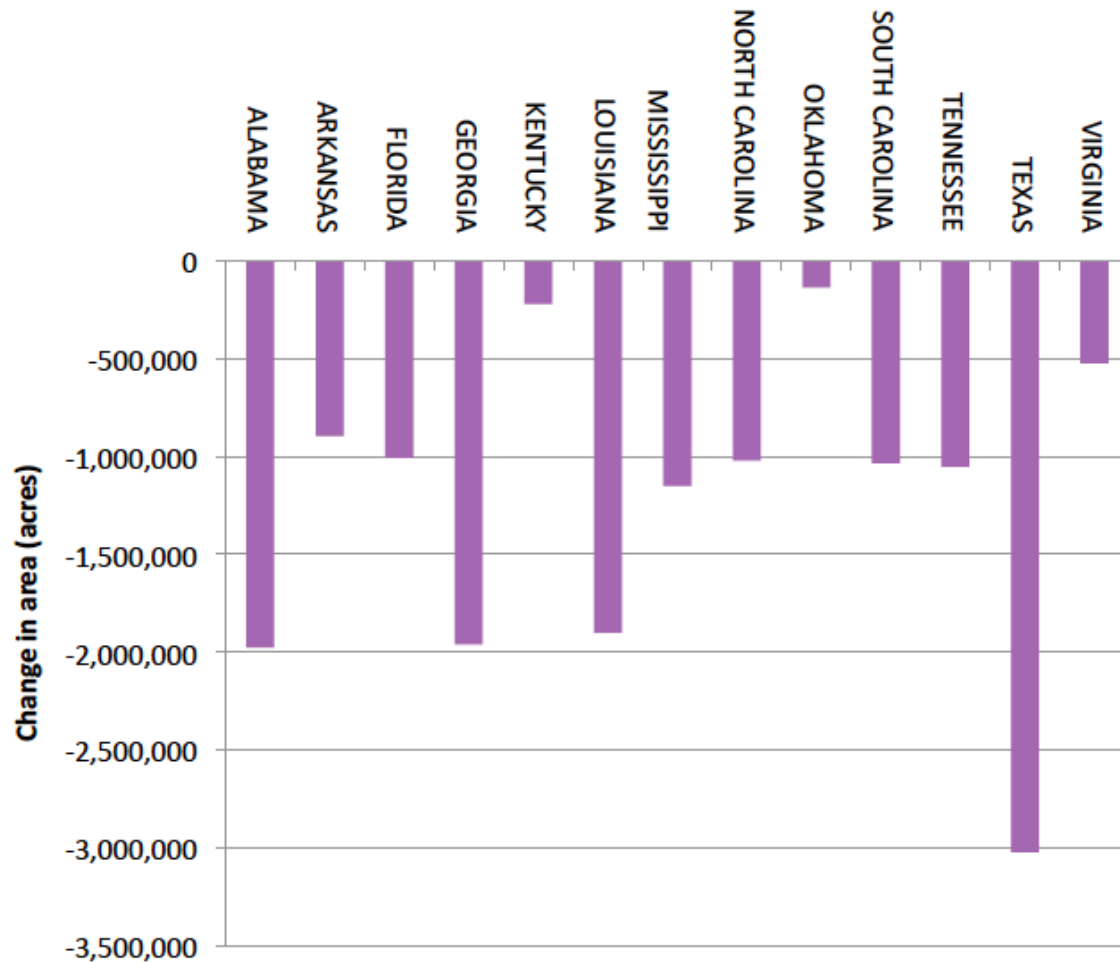


Timber Mart-South

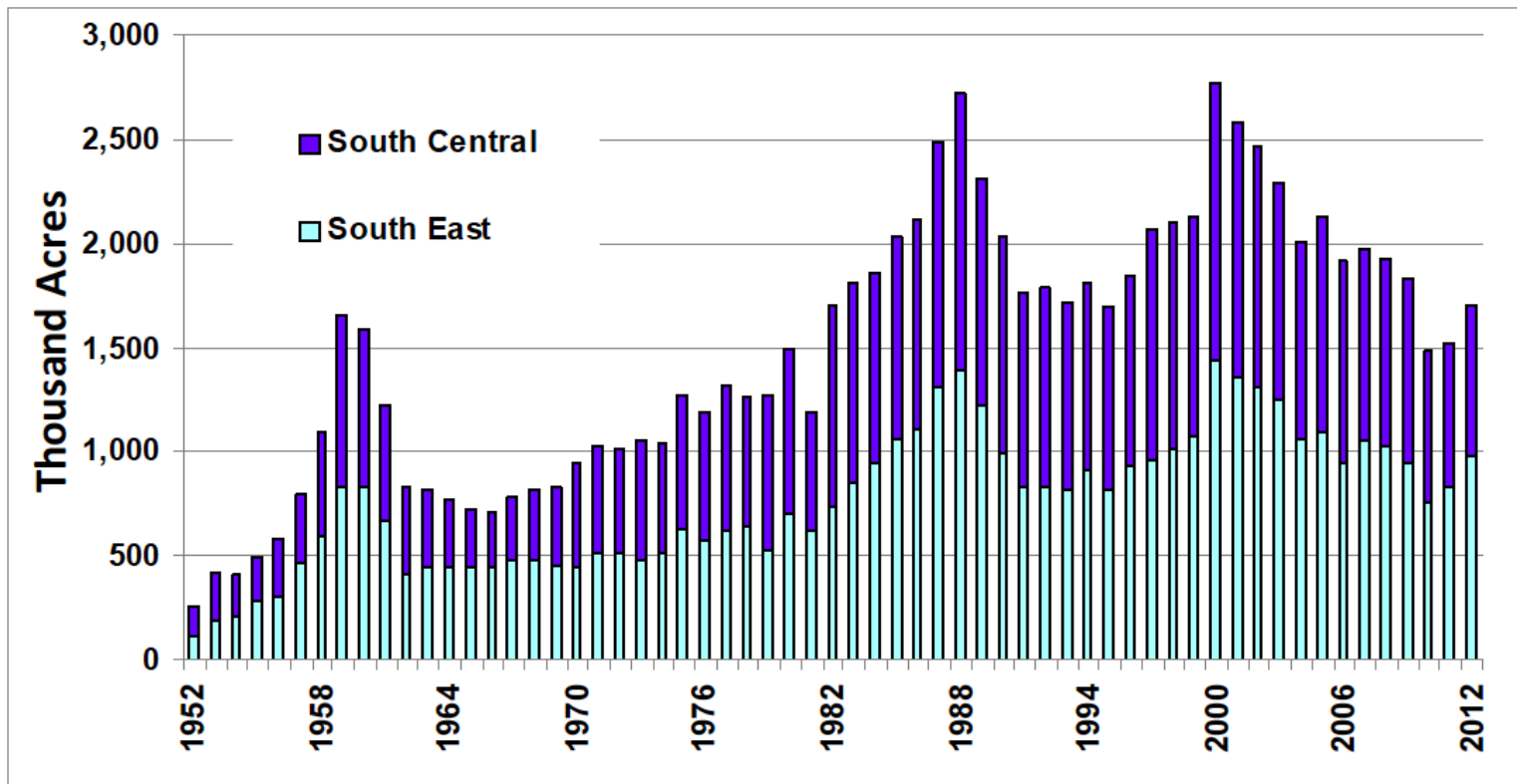
Ownership by industry and investment segment



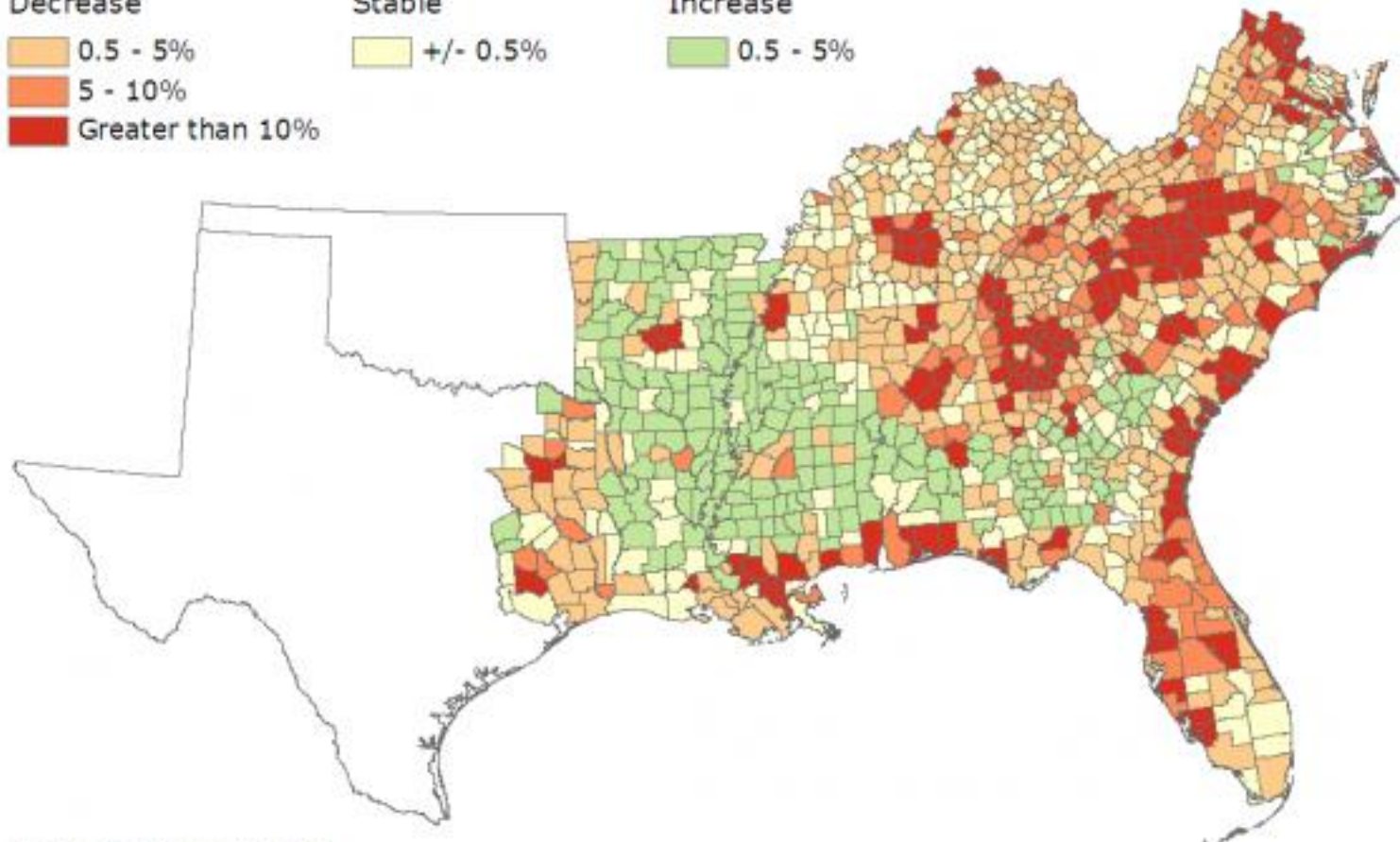
Decline in forest industry-owned acreage 1998-2008



Acres planted in the South, by region 1952 - 2012



Projected Change in Forest Area by County (1992-2020)



Note: Data from Oklahoma not available.

Sources: Forest area projections (Wear and Greis, 2002); administrative boundaries (ESRI Data and Maps 9.3.1, ESRI, 2008); color symbols (ColorBrewer.org, 2009).

0 50 100 200 300 400 Miles



Project Change in Forest Area by County, (1992-2020)

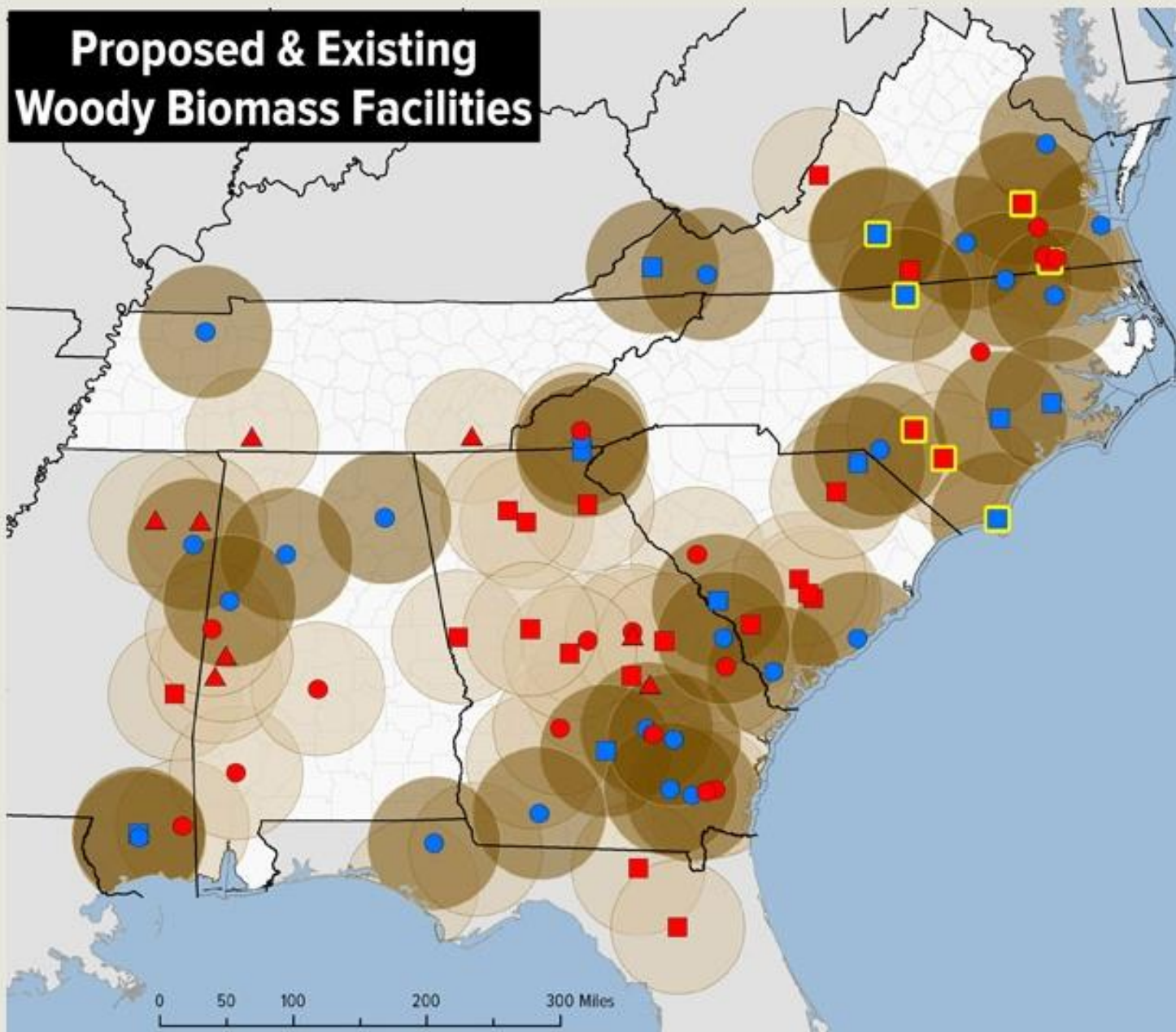
Bioenergy markets

- Harvesting woody biomass for use as bioenergy is forecasted to range from 170 million to 336 million green tons by 2050, an increase of 54 to 113 percent over current levels.
- Consumption forecasts for forest biomass-based energy, which are based on Energy Information Administration projections, have a high level of uncertainty given the interplay between public policies and the supply and investment decisions of forest landowners.
- It is unlikely that the biomass requirement for energy would be met through harvest residues and urban wood waste alone.
- As consumption increases, harvested timber (especially pine pulpwood) would quickly become the preferred feedstock.
- The emergence of a new woody biomass based energy market would potentially lead to price increases for merchantable timber, resulting in increased returns for forest landowners.
- While woody biomass harvest is expected to increase with higher prices, forest inventories would not necessarily decline because of increased plantations of fast growing species, afforestation of agricultural or pasturelands, and intensive management of forest land.
- Because it would allow more output per acre of forest land and dampen potential price increases, forest productivity is a key variable in market futures.
- The impacts that increased use of woody biomass for energy would have on the forest products industry could be mitigated by improved productivity through forest management and/or by increased output from currently unmanaged forests.

Bioenergy markets

- Price volatility associated with increased use of woody biomass for energy is expected to be higher for pulpwood than for sawtimber.
- The impacts of wood based energy markets tend to be lower for sawtimber industries, although markets for all products would be affected at the highest levels of projected demand.
- Different types of wood based energy conversion technologies occupy different places on the cost feasibility spectrum.
- Combined heat and power, co-firing for electricity, and pellet technologies are commercially viable and have good prospects in the future. Biochemical and thermochemical technologies used to produce liquid fuels from woody biomass are not yet commercially viable.
- Current research does not suggest which woody species and what traits would likely be most successful for energy production. The future of conversion technologies is uncertain.
- In the absence of government support, research, pilot projects, and incentives for production and commercialization of woody bioenergy markets are unlikely to develop.
- Forecasted levels of woody biomass harvests could lead to a reduction of stand productivity deterioration of biodiversity, depletion of soil fertility, and a decline in water quality.
- Although research provides some guidelines for the design of management to protect various forest ecosystem services, forest sustainability benchmarks for bioenergy are not well defined and existing certification systems have few relevant standards.

Proposed & Existing Woody Biomass Facilities



LEGEND

- Facility Type**
- Fuel Pellet Plant - Operating (Blue circle)
 - Fuel Pellet Plant - Proposed (Red circle)
 - Power Station - Operating (Blue square)
 - Power Station (repowered CFPP) - Operating (Yellow square with blue border)
 - Power Station - Proposed (Red square)
 - Power Station (repowered CFPP) - Proposed (Yellow square with red border)
 - Cellulosic Ethanol - Proposed (Red triangle)

- Sourcing Area (approximate)**
- Operating Facility (Dark brown circle)
 - Proposed Facility (Light brown circle)

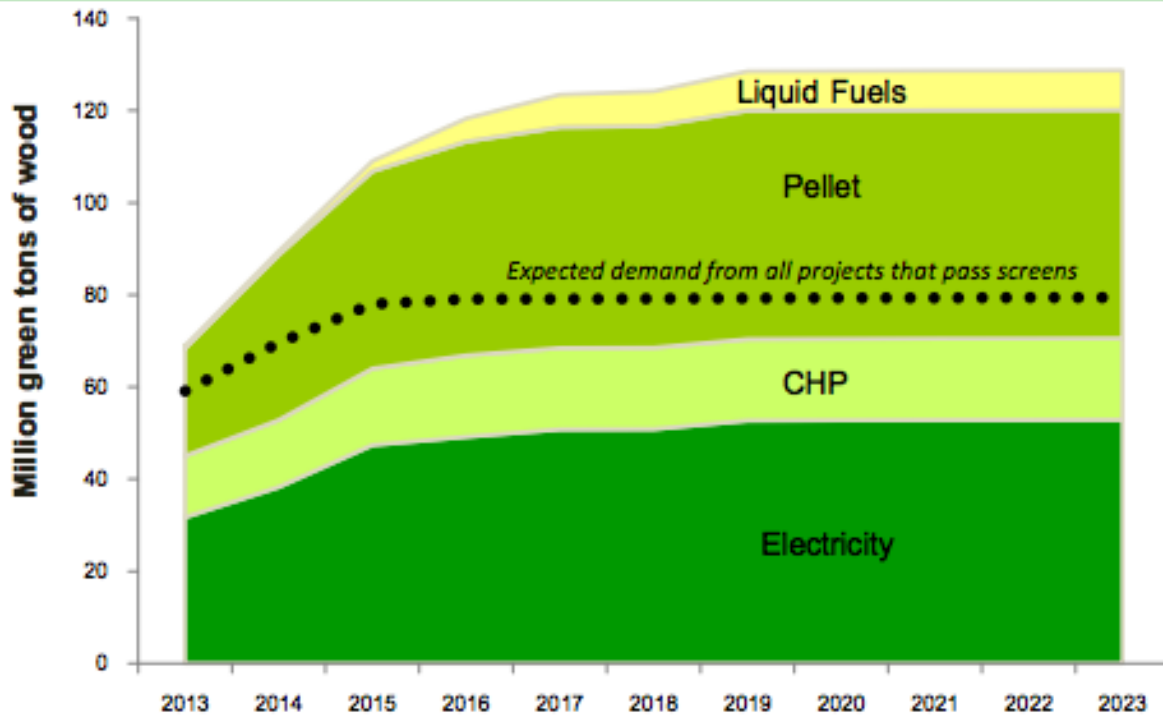
*Data collected from industry and media releases.
Map updated: 7/1/2013*



Number and Wood Use of Announced and Operating Projects, 2023

Region	Number of Projects by Type					Total	Total that pass screens	Wood Use of All Projects gtons	Wood Use of Projects that Pass Screens gtons
	Electricity	CHP	Thermal	Liquid Fuel	Pellet				
North	67	26	8	10	88	199	141	41,449,073	27,170,098
South	39	22	10	21	68	160	90	67,599,754	39,007,006
West	41	17	2	5	40	105	67	20,281,471	13,242,796
Total	147	65	20	36	196	464	298	129,330,298	79,419,900

Estimated Wood Use by Announced Facilities



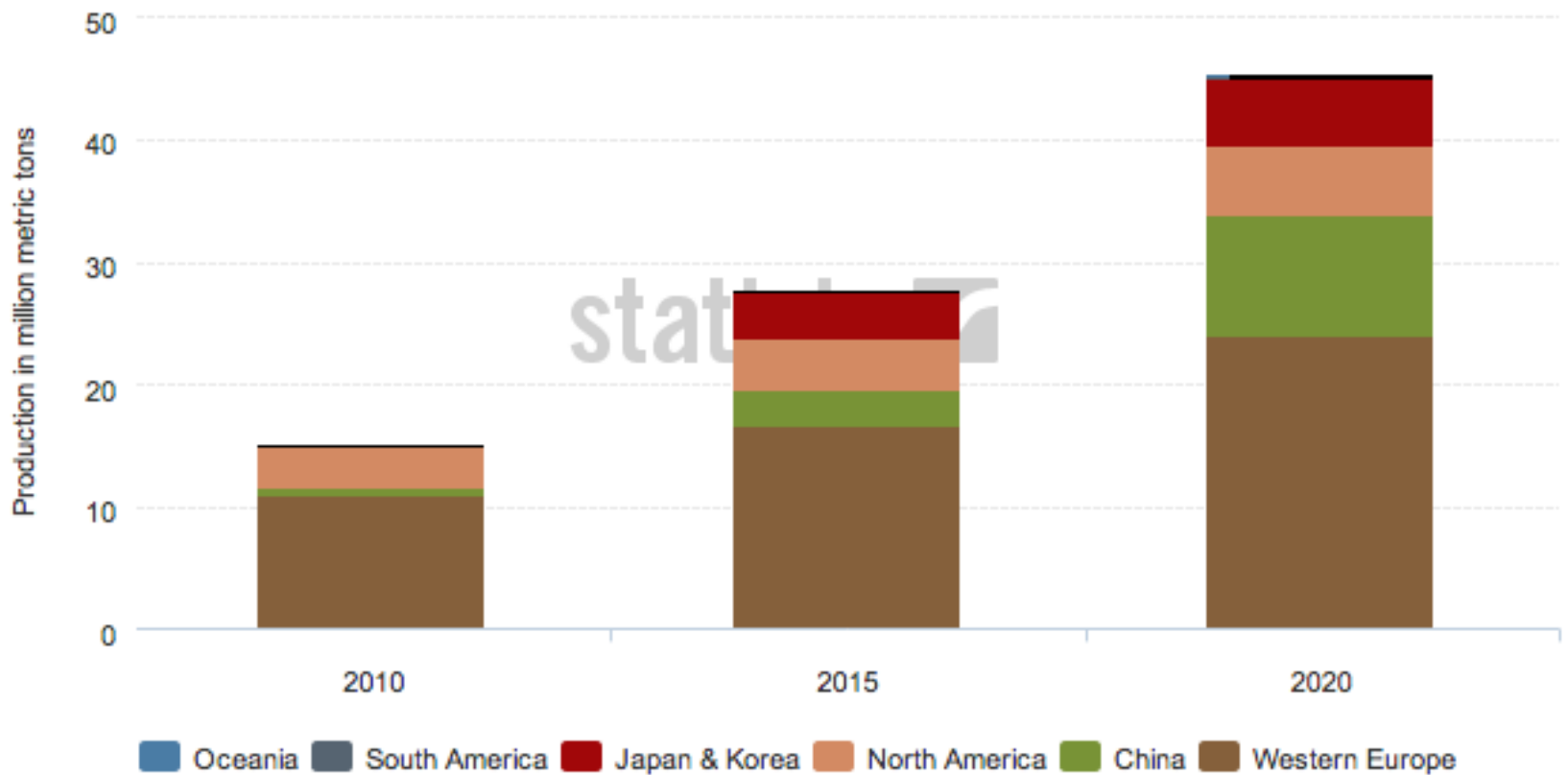
Notes

- CHP is combined heat and power, or cogeneration. Thermal volumes are less than 1% of total volume in 2023.
- "Expected Demand" is estimated wood use by all projects that pass the technology and status screens.
- Assume 100% wood use unless feedstock mix is specified.
- If a project does not announce a startup date, then Forisk estimates the start date.
- Technology: if the technology is viable today, then the project passes the technology screen. Pelletizing technology and electricity are currently proven technologies that pass this screen. Cellulosic ethanol from wood feedstock is still a developing technology and is currently not operational.
- Status: if the project has received/secured/signed two or more of the following then it passes the status screen: financing, air quality permits, Engineering Procurement and Construction contracts, off-take agreements, interconnection agreements for electricity facilities, and supply agreements.

The new kid on the block: the wood pellet



Global wood pellet consumption from 2010 to 2020, by region (in million metric tons)*

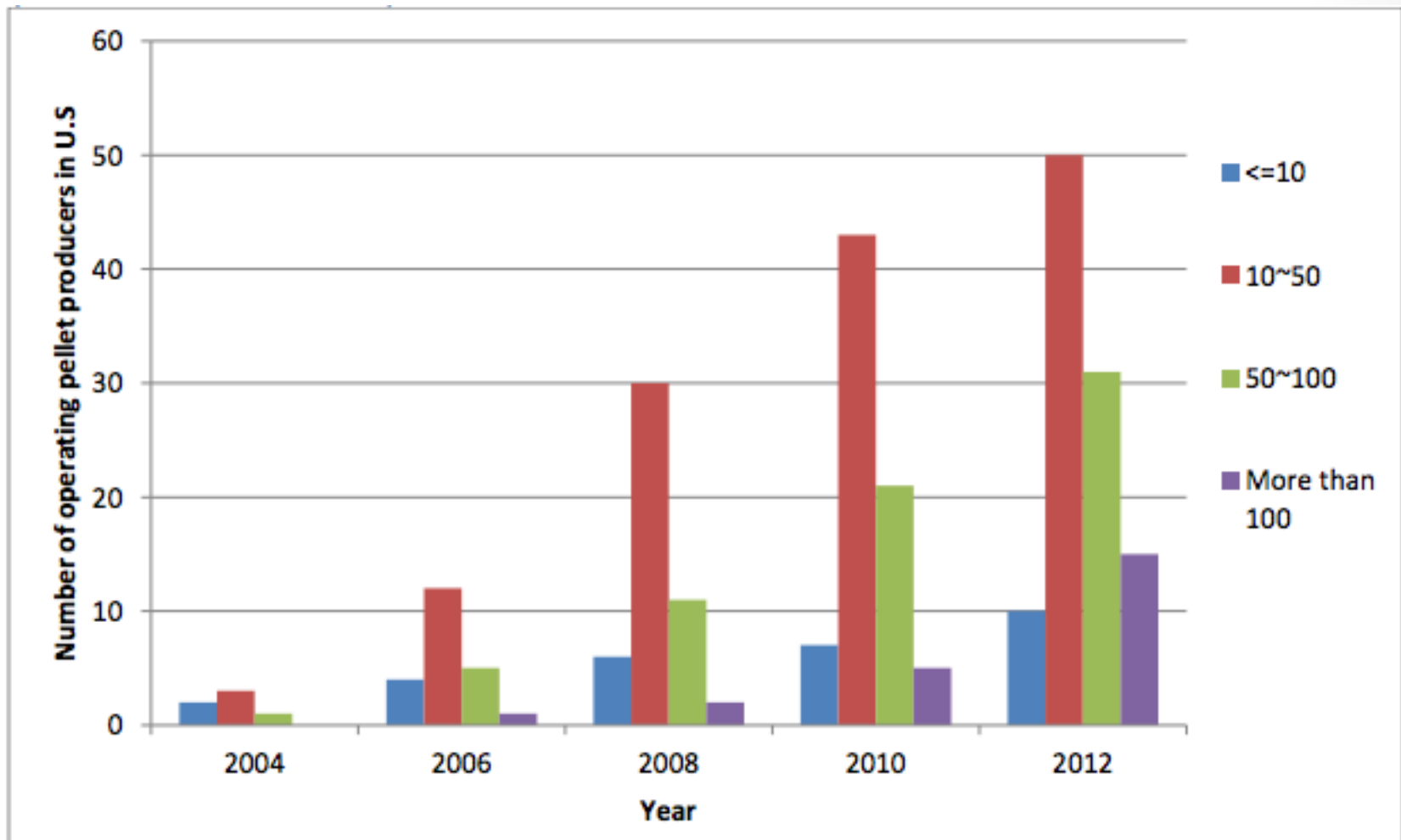


i Worldwide

Source: Pöyry

© Statista 2013

Growth trend in number of pellet manufacturers



Source: Forisk Consulting, 9/2013 (<http://forisk.com>)

Wood Pellet Plants and European Export

Conceptual Plant to Market Flow Map

Map available: http://www.southernenvironment.org/cases/biomass_energy_in_the_south/maps/
 Data Sources: Pellet Industry Releases and Websites; US Census Bureau
 Last updated: 7/1/2013 | Map created by Jovian Sackett (jsackett@selcnc.org)



Recent Forest2Market.Com Analysis

Figure 3: Wood Consumption from All Likely Sources

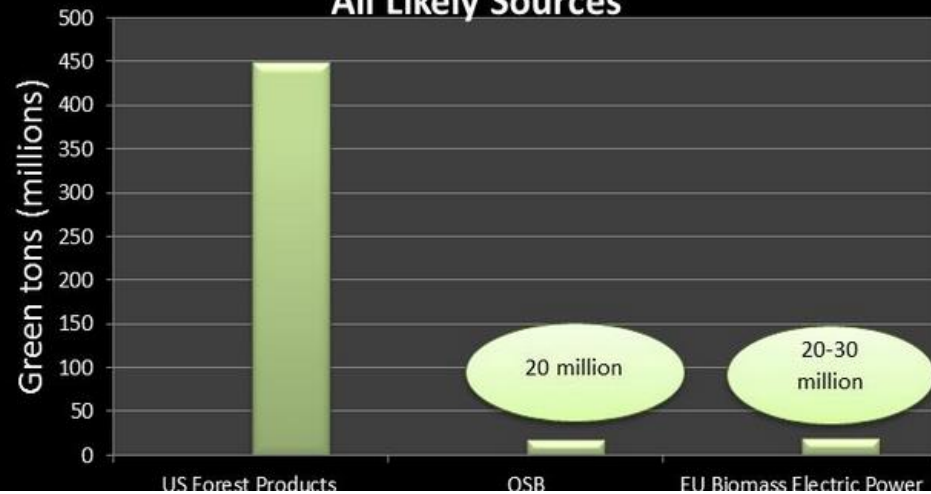
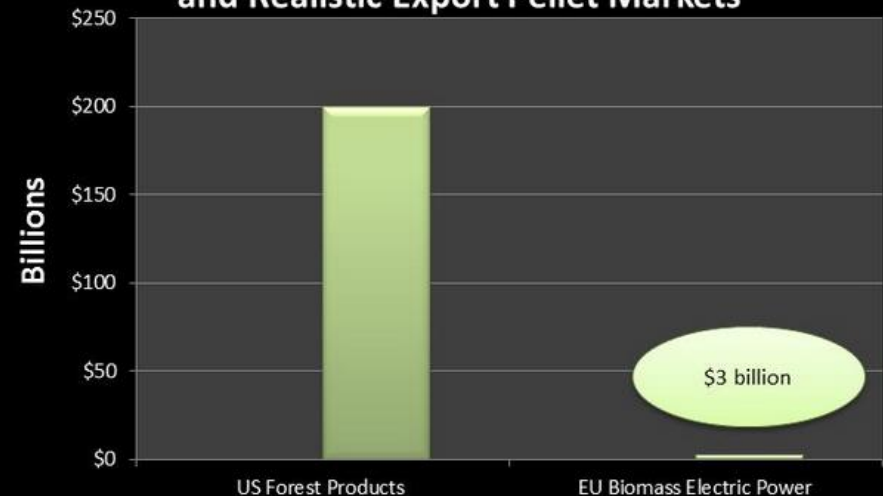


Figure 4: Comparison of US Forest Products and Realistic Export Pellet Markets



Source: Forest2Market, 9/2013
(<http://forest2market.com>)

Forestry in the Farm Bill

- New market opportunities for forest products (CSP, CRP, Biomass/Bioenergy programs)
- More conservation tools to forest owners (Forest Legacy)
- Strengthened programs to fight invasive forest pests (Healthy Forest Reserve Program)
- Protection for woodland owners from unnecessary permit requirements & regulations.
- Many programs repealed though (FLEP, WFAP)

Forest Certification Programs

- Designed to utilize the market system to ensure sustainable forestry is practiced
- International roots
- Three systems have “matured” over the past 10 years
 - Forest Stewardship Council (FSC) - Environmental
 - Sustainable Forestry Initiative (SFI) - Industry
 - American Tree Farm System (ATFS) – Family Forest

Forest Certification Programs

- Standards regulate such actions as:
 - Clear cut size
 - Use of chemicals
 - “Green up” requirements
 - Social justice audits
 - Wildlife, biodiversity, water quality, etc.
- Remains contentious
- Costly to landowners and producers
- No major market returns as of yet, but becoming an important market access tool

The US Green Building Council & L.E.E.D

- LEED certification doesn't consider wood products to the extent the forest industry would like (it only recognizes FSC for example)
- Several state governor's offices petitioned equal consideration of all certified wood systems in the LEED program.



Timber Tax

- Timber sales are treated as capital gains
- Taxes depend on your purpose:
 - Personal use, investment, or business
- Reforestation tax credit still exists for the first \$10,000 of expenses in a given year;
- Calculation of the basis is still important
- Records are critical
- Estate tax repeal and reinstatement was a big concern

Climate change

- Droughts
- Higher temperatures
- More catastrophic weather events
- Wildfire, invasives, exotics
- Changing rotation ages
- Higher risks
- Species migration
- Importance of forest resilience and active forest management
- PINEMAP

Forest industry finally has a check-off program

- Softwood lumber check off program
- Hardwood lumber check off program



Sources of information and references

- USDA Forest Service (<http://www.fs.fed.us>)
- TimberMart South (<http://timbermart-south.com>)
- Forest2Market (<http://forest2market.com>)
- Forisk Consulting (<http://forisk.com>)
- Statistica.com