



Sub-Regional Timber Supply Model

Data, Model, and Projection Updates

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Presentations and Data on SOFAC Site

<http://www.cnr.ncsu.edu/sofac>

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- home
- presentations
- srts model
- international
- administration

SRTS

Model Information :

- [How to Run SRTS \(zip\)](#)
- [Latest Input Files \(v22\)](#)
- [SRTS region numbers and links to eco-provinces](#)
- [Software for creating basin input files](#)
- [Software for estimating logging residuals](#)
- [Software for estimating young inventory volumes](#)

Recent Output :

- [Results handouts from 10/08 meeting](#)
- [Detailed v20 output with logging residual estimates](#)
- [v20 Map Images](#)
- [Poster of v18 Southwide Results](#)

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MP-SRTS Collaborative Research

- ❑ Links to land-use model (USFS)
- ❑ Biomass (Duke, RTI, OSU)
- ❑ Alternative elasticities (RTI)
- ❑ Plantation Management (NCASI/Cabbage)
- ❑ Global Economic Situation (OSU)
- ❑ USFS FIA (Ray Sheffield)
- ❑ USFS Economics (Karen Abt)



Grad Students

- Shan Liu (MS)
 - Availability
 - Carbon Accounting
- Jesse Henderson (MS)
 - Co-firing Demand
 - Carbon/Renewable Energy Tradeoffs



Grad Students

- Yun Wu (PhD)
 - Integrated Paper/Biofuel Modeling
- Navinderpal Singh (PhD)
 - Harvest Modeling/Availability
 - Carbon Modeling



Outline

- Intro to Model
 - Quick overview for new members/ reps
- Model Changes
 - Biomass accounting
 - Status of revisions
- Data Changes
 - Version 21-22
 - <age 15 workarounds
- Latest Results
- Future Priorities



MP-SRTS Model Description

- Inventory, Growth, Removals and Acres are Tracked By:
 - **Region** – e.g. survey units
 - **Owner** – Corp or NonCorp
 - **Species Group** – Pine, Soft Hwd, Hard Hwd
 - **Mgt. Type** – Plt Pine, Nat Pine, Mix Pine, Upland Hwd, Lowland Hwd
 - **Age Class** – 5 year



MP-SRTS Model Description

- Demand Assumptions Can Be:
 - Harvest Driven
 - Harvest is fixed – price is free to move
 - No feedback to demand
 - Demand Driven
 - Harvest adjusts to price trends
 - Demand \longleftrightarrow Price feedback
 - Must assume demand response (elasticity)
 - Price Driven
 - Harvest consistent with a given price trend



MP-SRTS Model Description

□ Harvest

- starts with FIA harvest distribution
- change modeled as a function of stumpage price and inventory (by product)

□ Model Solution

- Given the demand for this scenario (by year and product)
- Given the supply from changing inventory (by region, year and product)
- Find the price and harvest level and location that clears the market



Typical Resource Analysis

- Start with FIA
- Update Removals
 - TPO/Pulpwood Production
 - Competitor intelligence
- Update Plantation Growth
 - New Ownership Structure
- Update Acres
 - Total Timberland
 - Plantation Acres
 - Remote sensed Data
 - Acres by type
 - Age class distribution
 - Hurricane/Fire/Pine Beetle Impacts



Typical Resource Analysis

- Project Demand or Harvest
 - Assumption based on trends
- Project Acres (timberland/planted)
 - assumption
 - price responsive
- Project Growth
 - FIA for natural
 - increase for planted?



Model Outputs by Product

- ❑ Inventory Trends By
Product/Region/Owner
- ❑ Harvest Shifts Between
Owners/Regions/Types
- ❑ Price Trends by Product



Two Standard Scales

- Overview of the South
 - Used in Southern Forest Resource Assessment, South's Fourth Forest, SGSF
 - FPJ and JOSF Articles
- Focus on One SubRegion
 - Mill location or basin outlook studies
 - NC RPS Analysis (BnB)
 - NC Chipmill Study (2001)
- Useful to put Subregion in a Broader Market Context
 - No basin is an island



Interface

MultiProduct SRTS 3.0

<input type="button" value="END"/>	<input type="text" value="MP-SRTS"/>			DRIVER		OPTIONS	
<input type="button" value="Run"/>	Run <input type="text"/>	Region <input type="text" value="south16_3"/>	No. <input type="text" value="a"/>	<input type="radio"/> Harvest	<input type="checkbox"/> Acre Change	<input type="checkbox"/> Product Weights	
<input type="button" value="Quit"/>	<input type="button" value="Check HVMISS File"/>			<input checked="" type="radio"/> Demand	<input type="checkbox"/> Price Ceiling	<input checked="" type="checkbox"/> Growth Calibration	
				<input type="radio"/> Price	<input type="checkbox"/> Harvest Location		

Loading SRTS on Laptops Weds Afternoon



Does timber supply matter?

- Since price depends on supply and demand, seems logical to conclude yes
- But, in a lot of cases it doesn't matter much:
 - Short run
 - Long run



Does timber supply matter?

- Not Much in the Short-run
 - Supply (wood available for harvest at a given price) doesn't change quickly
- Exceptions
 - Weather
 - Seasonal wet/dry periods
 - Hurricanes
 - SPB
- Most price variation comes from demand fluctuation
- Most relevant for selling timber



Does timber supply matter?

- Not Much in the Long-run
 - Demand shifters (e.g. capacity/technology) will adjust
 - Price tend toward global constant real prices
- Examples
 - Technology
 - Substitute hwd for pine pulpwood
 - Substitute small trees (OSB) for big trees (plywood)
 - Capacity
 - Pulp capacity decline
 - Shift of capacity to lower cost regions
- Long-run forecasts relevant to policy, less relevant to current investment

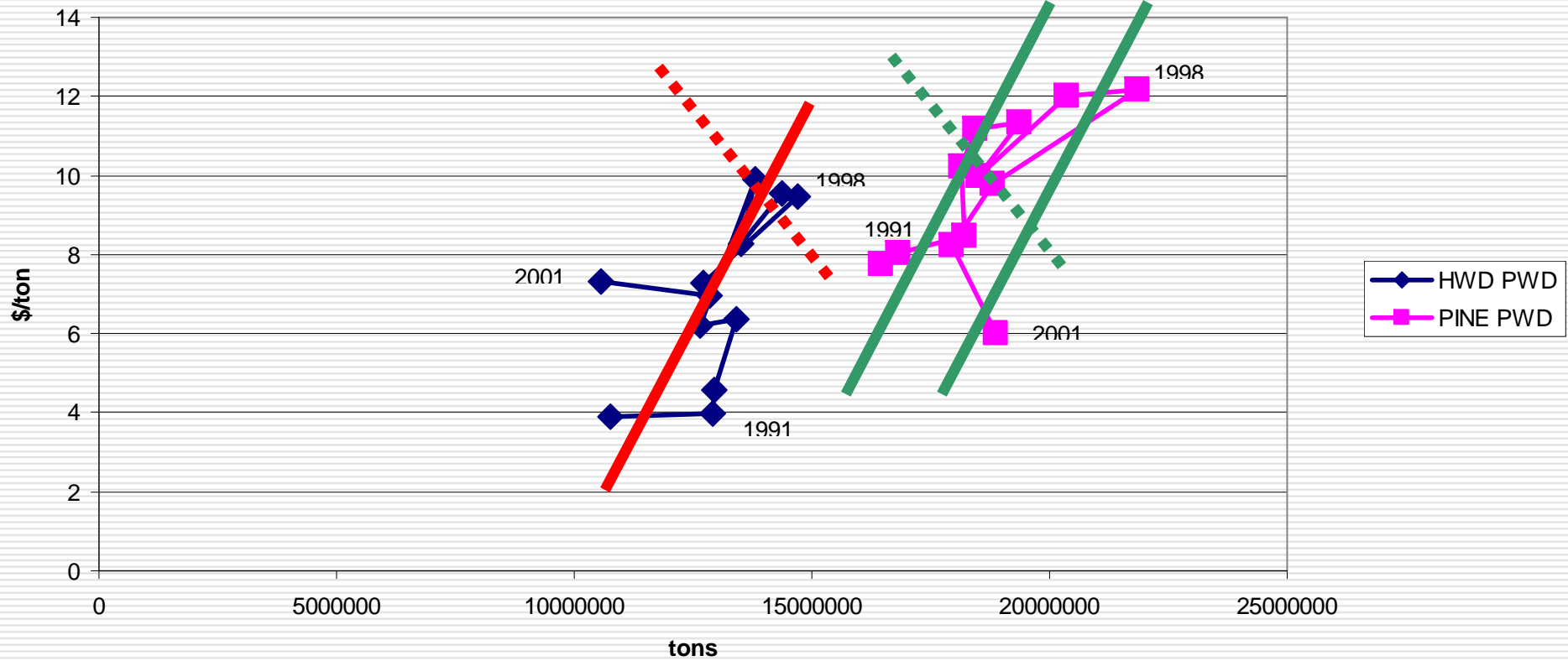


Does timber supply matter?

- What about the medium run?
 - 3-15 years – some adjustment
- Who cares about the medium run?
 - Timberland funds and wood-based industry
 - Timing
 - Location
 - Silvicultural treatments
 - Product price
 - Product mix



AL Pulpwood Mkt 1990-2001





Does timber supply matter?

- In the medium-run
 - Most price variation still comes from demand
- But,
 - Next 10-15 years of supply is already in the ground
 - Behavioral assumptions unlikely to change significantly



Does timber supply matter?

- Medium run supply is relatively predictable
- Has implications for,
 - Product mix over time
 - Comparative advantage across regions
 - Capacity shifts at the margin



Does timber supply matter?

- Current timber supply is linked to future timber demand
- Over time
 - Age class bubble will work its way through all product classes
- Across Space
 - New capacity location will be influenced by current timber supply



Data Vintage

State	SRTS vers 20		SRTS vers 21		SRTS vers 22	
	Year	GRM	Year	GRM	Year	GRM
AL	2007	Yes (100%)	2007	Yes (100%)	2008	Yes (100%)
AR	2005	yes (100%)	2005	yes (100%)	2005	yes (100%)
FL	2006	Yes (80%)	2006	Yes (80%)	2007	Yes (100%) *
GA	2006	Yes (100%)	2007	Yes (100%)	2008	Yes (100%)
KY	2004	yes	2004	yes	2004	yes
LA	2005	Yes (100%)	2005	Yes (100%)	2005	Yes (100%)
MS	2006	Yes (100%)	2006	Yes (100%)	2006	Yes (100%)
NC	2006	Yes (80%)	2006	Yes (80%)	2006	Yes (80%)
OK	1993	yes	1993	yes	1993	yes
SC	2006	Yes (100%)	2007	Yes (100%)	2007	Yes (100%)
TN	2006	Yes (100%)	2006	Yes (100%)	2007	Yes (100%)
TX (east)	2007	Yes (80%)	2008	Yes (100%)	2008	Yes (100%)
VA	2007	Yes (100%)	2007	Yes (100%)	2007	Yes (100%)
	Oct 2008		Jan 2009		Jul-09	

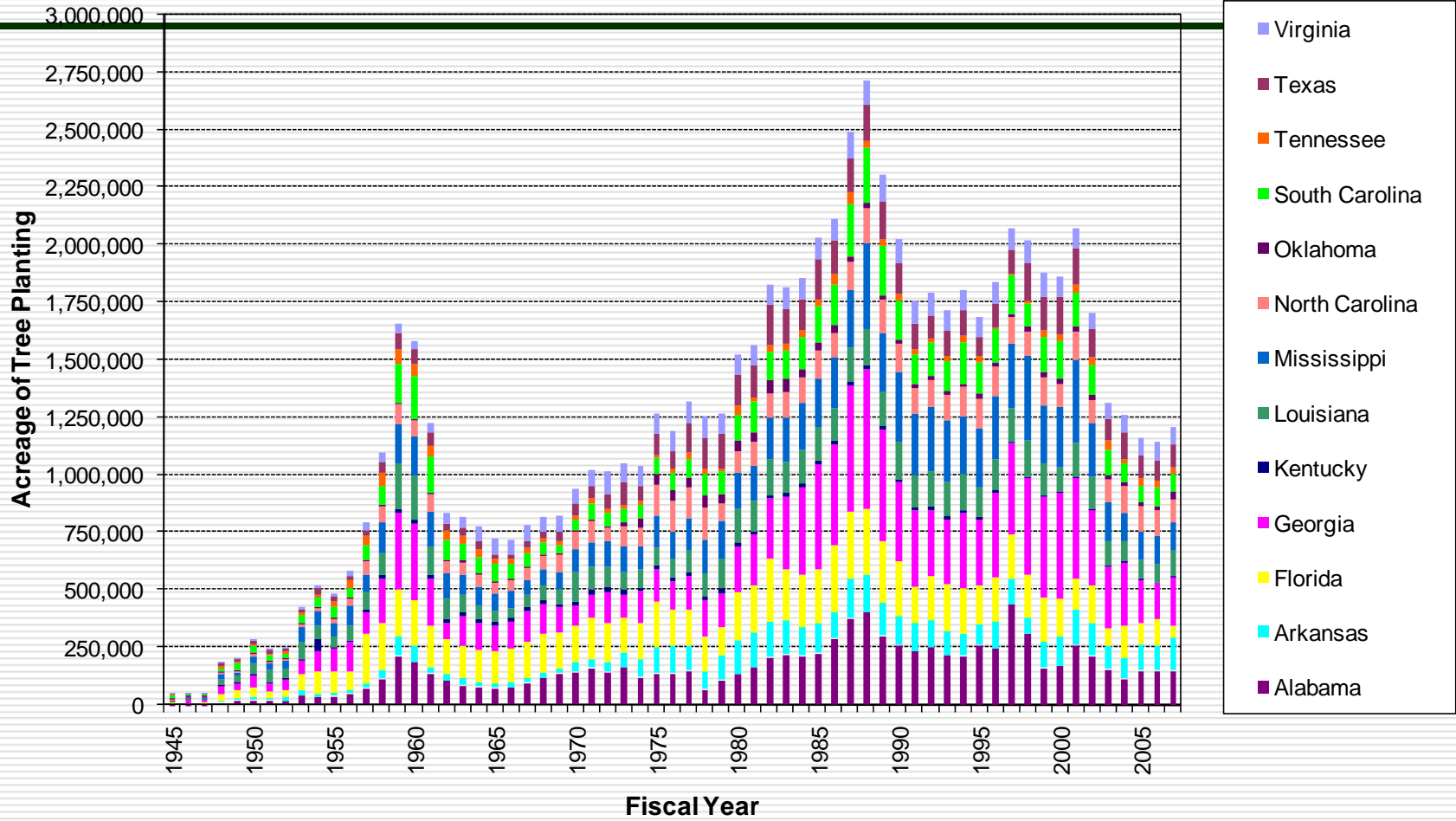


Recent Data Challenges

- Version 21
 - December 2008
 - Ray Sheffield's last week at USFS
- Version 22
 - Dependent on NCSU-USFS MOU
 - Ray as SOFAC consultant
 - MOU 4-5 months
 - Data from Sam Lambert 2-3 months
 - FIADB4 – expansion factors (pltsnap)
 - Data Online

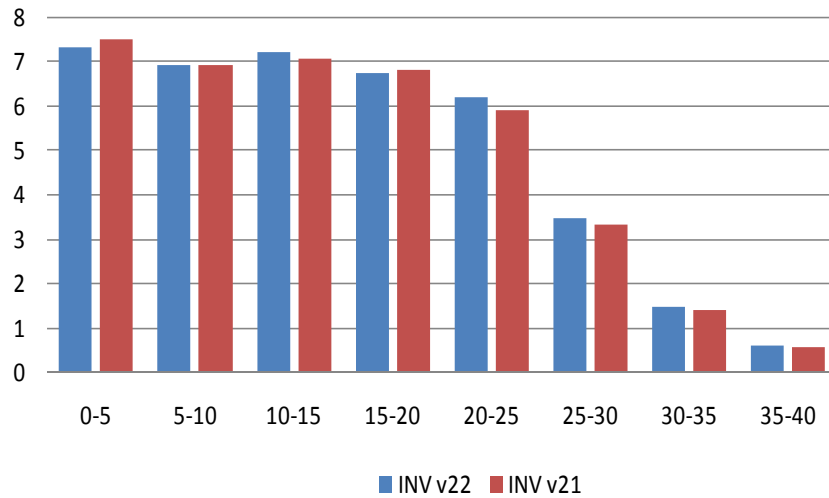


Southern Tree Planting, All States and Ownerships, 1945-2007

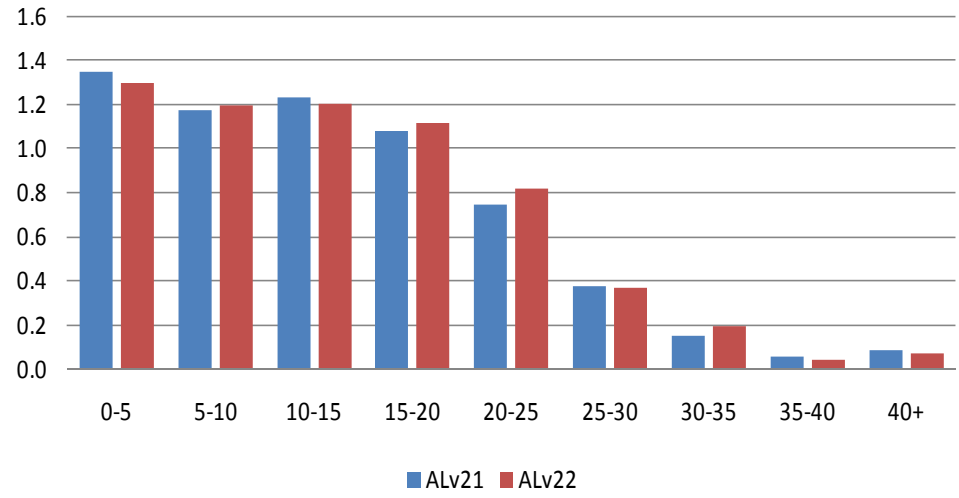


Source: USFS, GFC, TMS

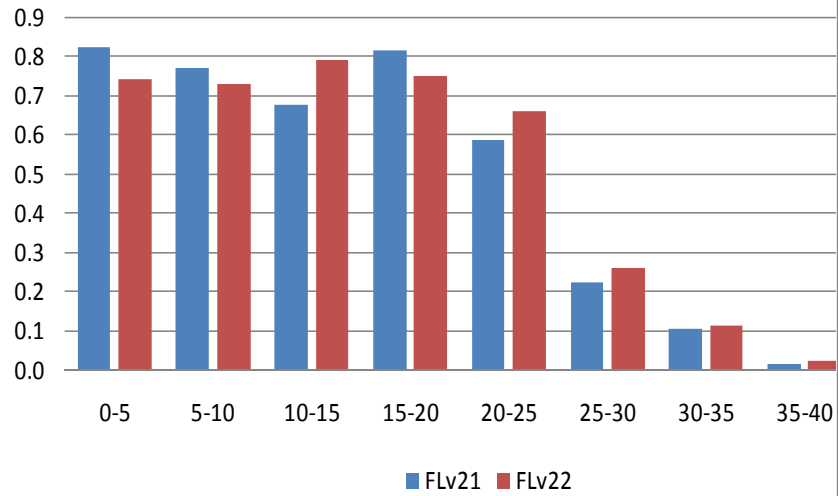
SO Plantation Acres By Data Version



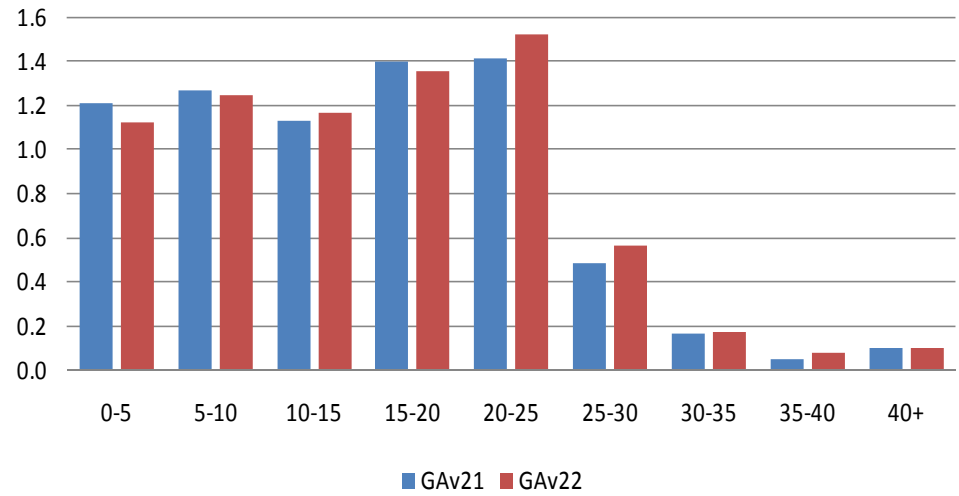
AL Plantation Acres By Data Version



FL Plantation Acres By Data Version

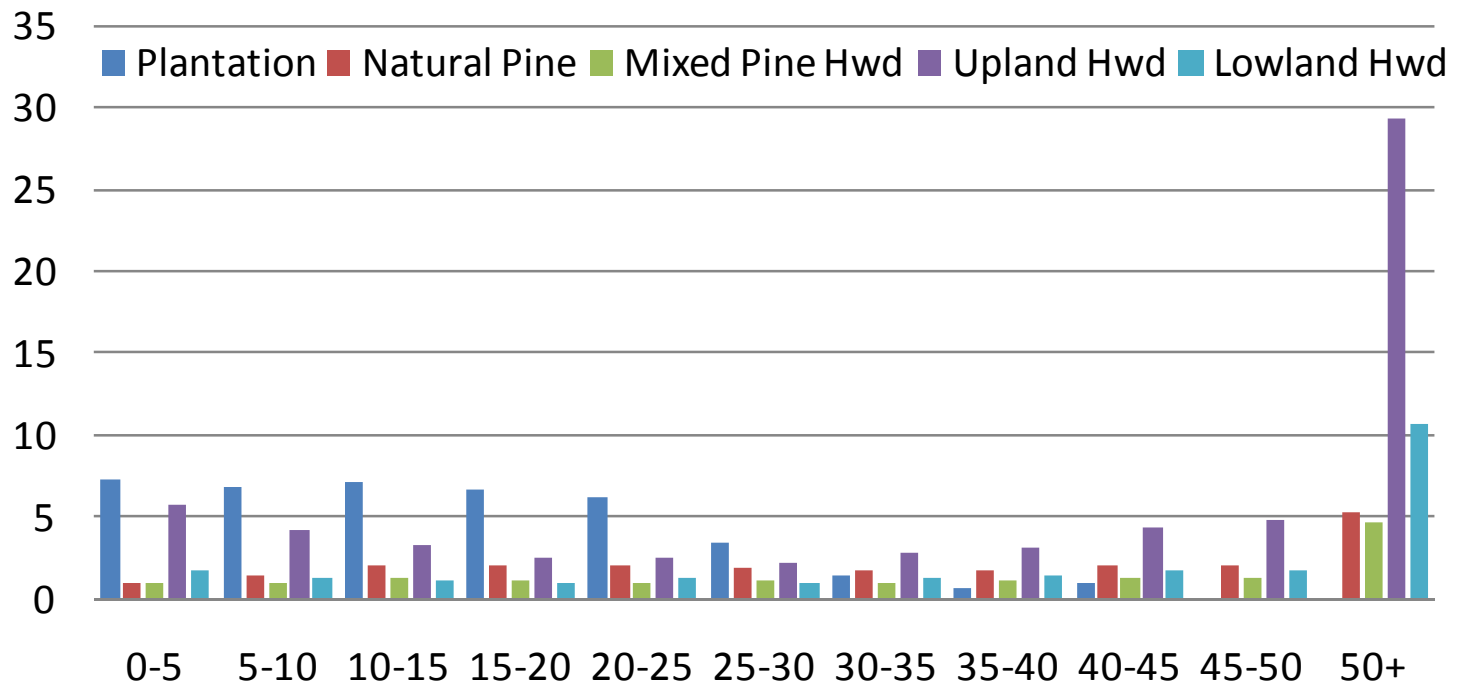


GA Plantation Acres By Data Version





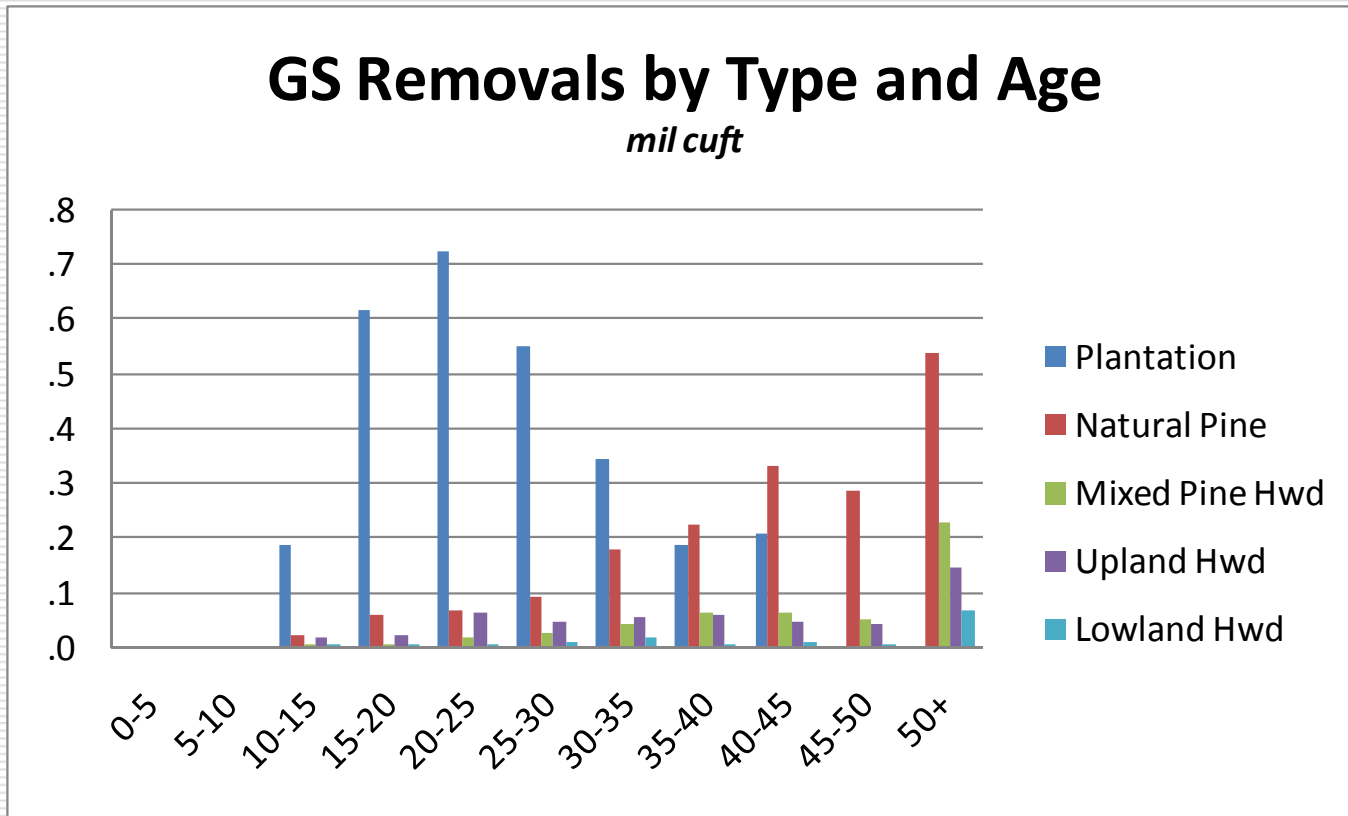
Acres by Mgt Type and Age Class





GS Removals by Type and Age

mil cuft





Run described last year

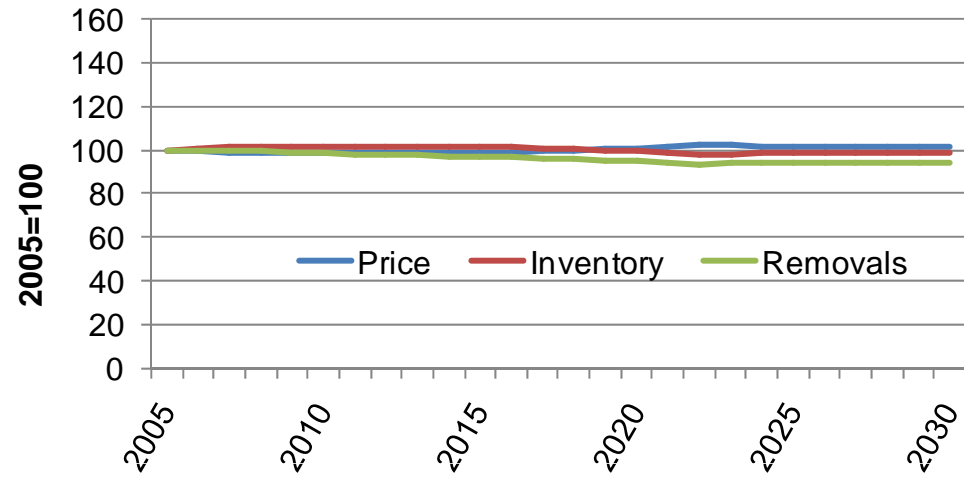
- No demand increase except for pulpwood (.5%/yr)
- Less Management Intensity
 - Plantation acres relatively constant
 - No bump or increase in plantation GPA
- Timberland loss based on Wear 2006
- Version 20 data

FPJ run parameters

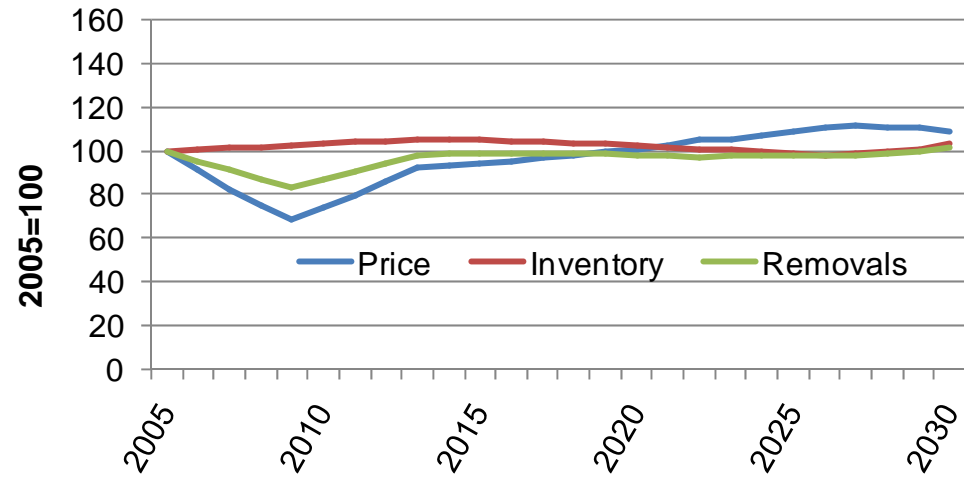
Data	Options	For this application
Product classes	User specified by 2 in. dbh class and percent of product class that should be counted as pulpwood (pw)	Softwood pulpwood <i>5-7in. dbh</i> Softwood small sawtimber; <i>7-9in. dbh 30% pw</i> Softwood medium sawtimber; <i>9-13in. dbh 20% pw</i> Softwood large sawtimber; <i>13 in. + 20% pw</i> Hardwood pulpwood <i>5-9in. dbh</i> Hardwood sawtimber <i>9+ in. 40% pw</i>
Demand and supply price elasticities; supply inventory elasticity	User-specified.	0.5 (demand and supply price); 1.0 (supply-inventory)
Demand scenarios	Demands can vary by product by year	Constant demand (base), Recession scenario reduces demand by 30% from 2005 to 2009, then returns demand to historical levels with subsequent increases in demand of 0.5% per year
Reforestation	Can respond to land prices, or can be set to exogenous level or weighted levels.	acres are set to decrease slower than other types if timberland is decreasing, and increase faster if timberland is increasing.
Land use	Can respond to timber price changes, or can be set to a fixed, exogenous level.	Price responsive with county demographic impacts from Hardie, et al.



Pine Pulpwood



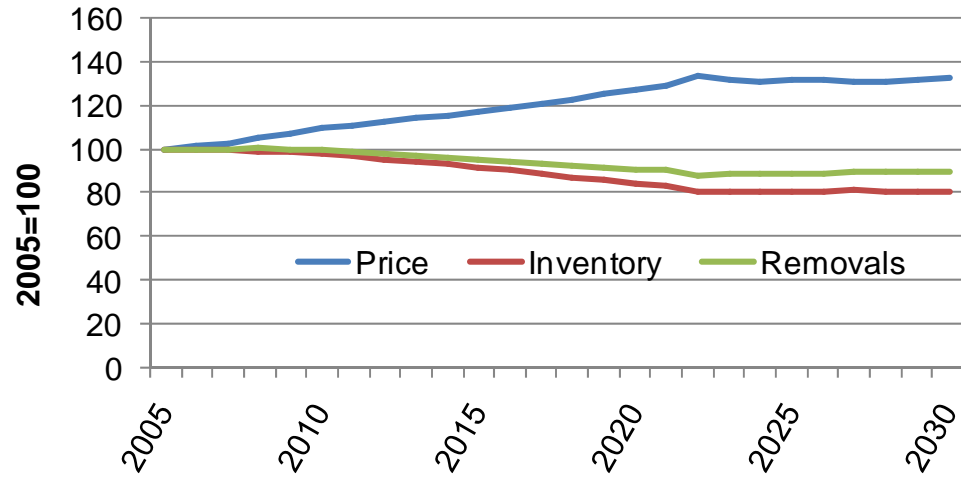
(a) Base scenario



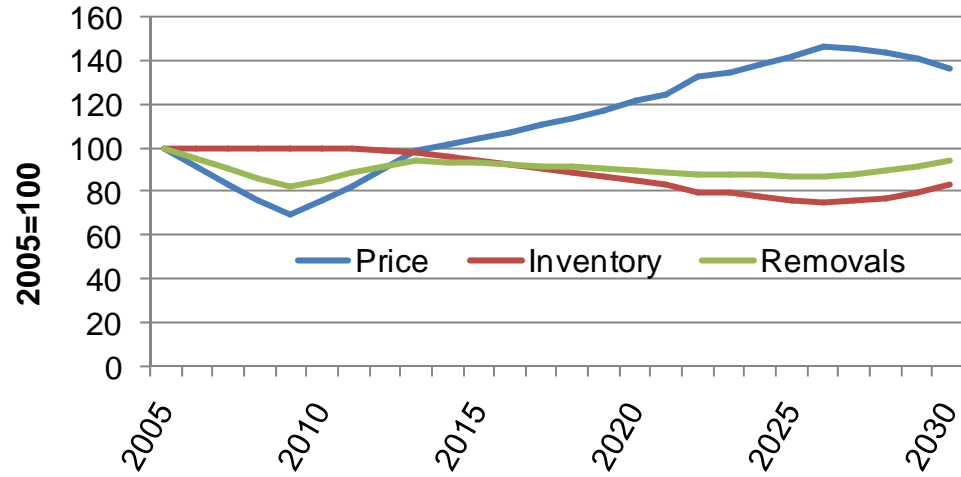
(b) Recession/recovery scenario



Pine Small Sawtimber



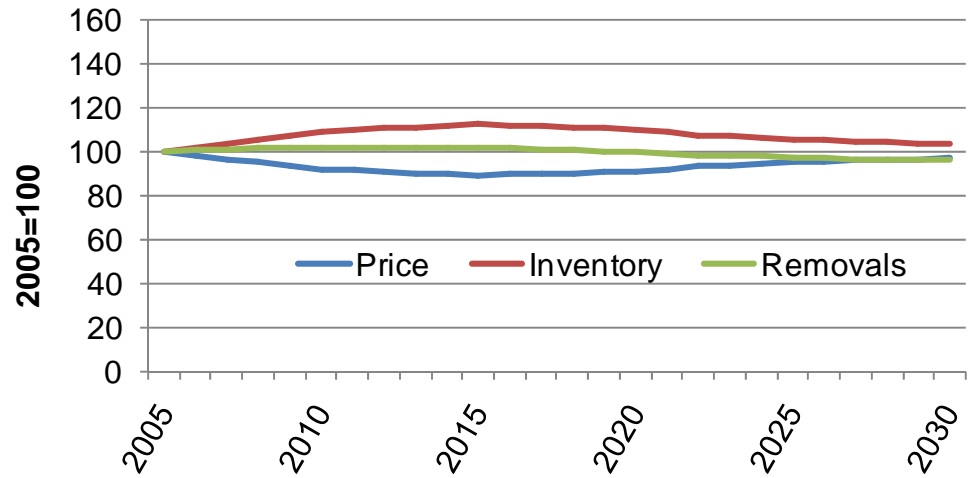
(a) Base scenario



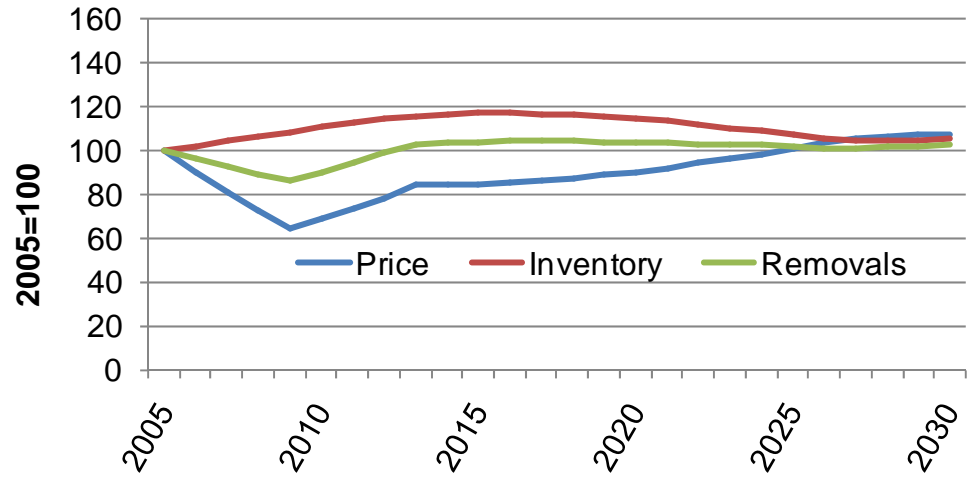
(b) Recession/recovery scenario



Pine Sawtimber



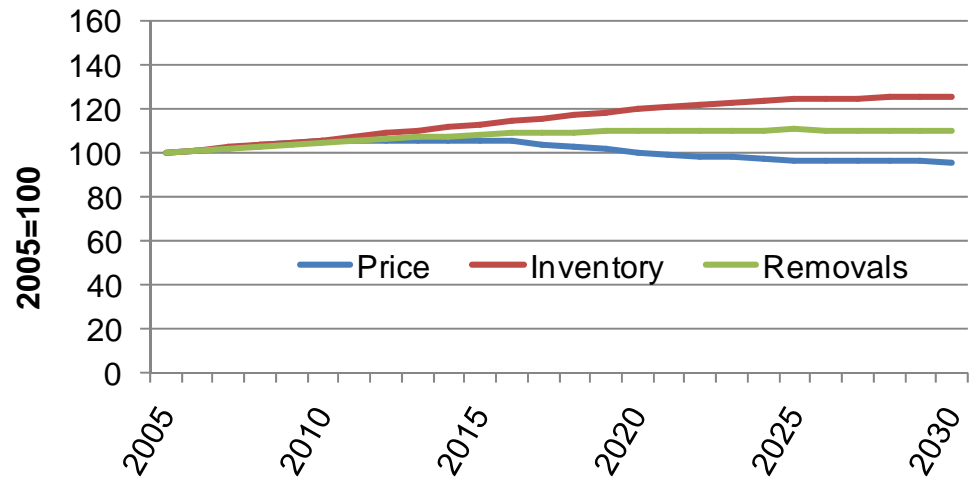
(a) Base scenario



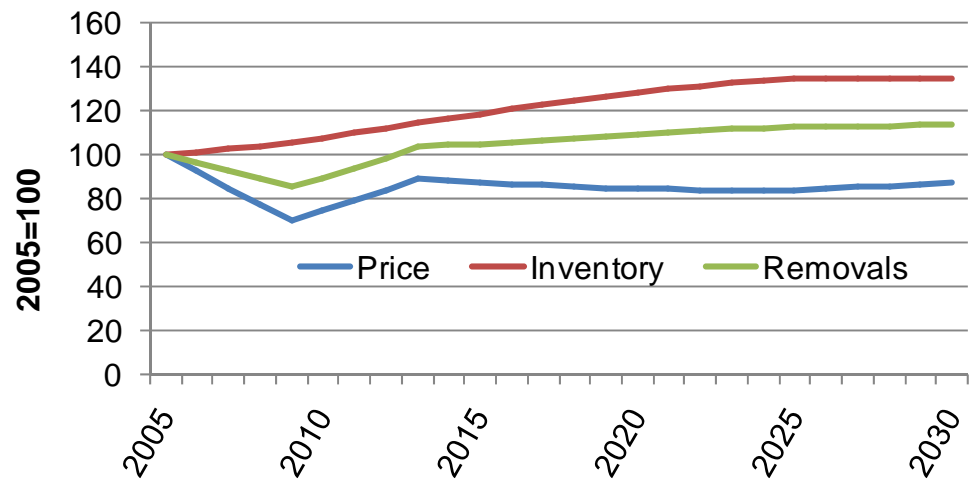
(b) Recession/recovery scenario



Pine Large Sawtimber



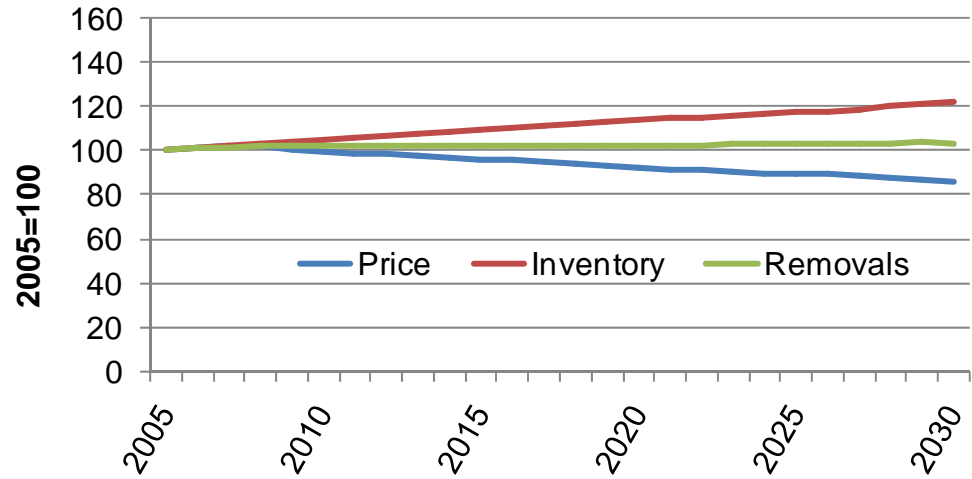
(a) Base scenario



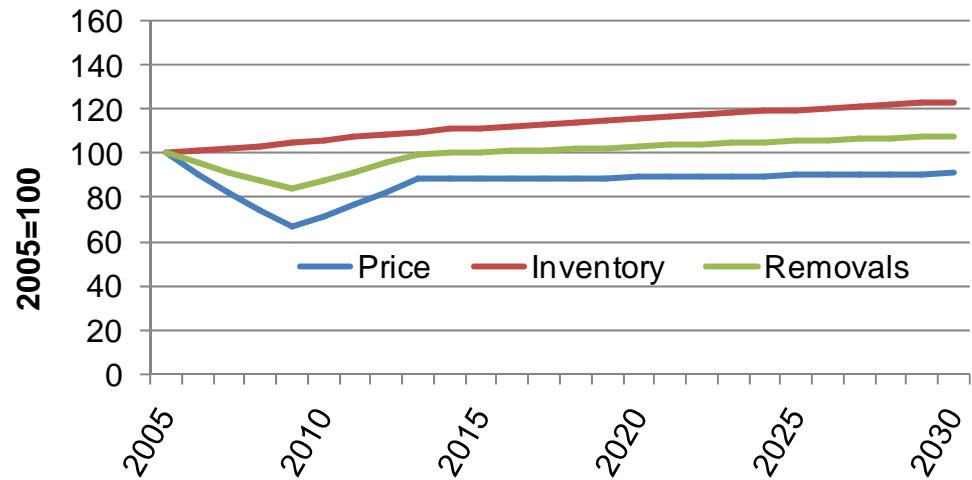
(b) Recession/recovery scenario



Hardwood Pulpwood



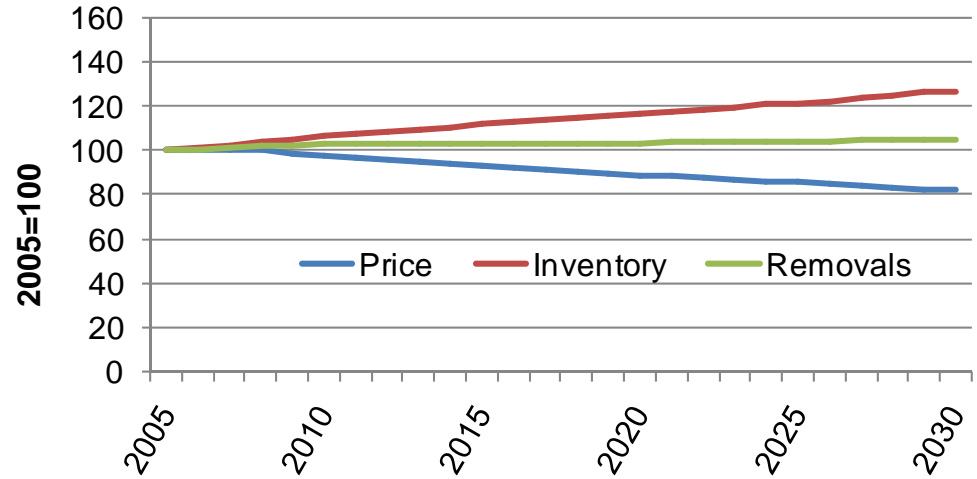
(a) Base scenario



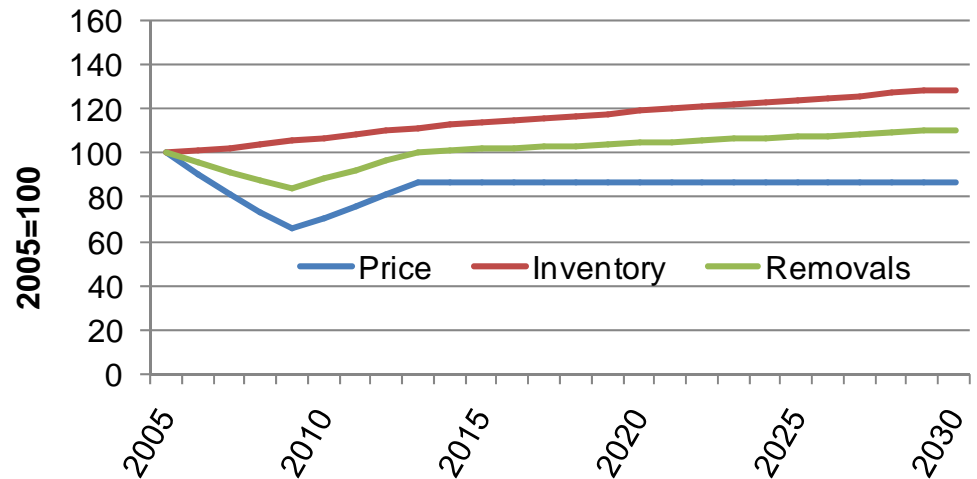
(b) Recession/recovery scenario



Hardwood Sawtimber



(a) Base scenario



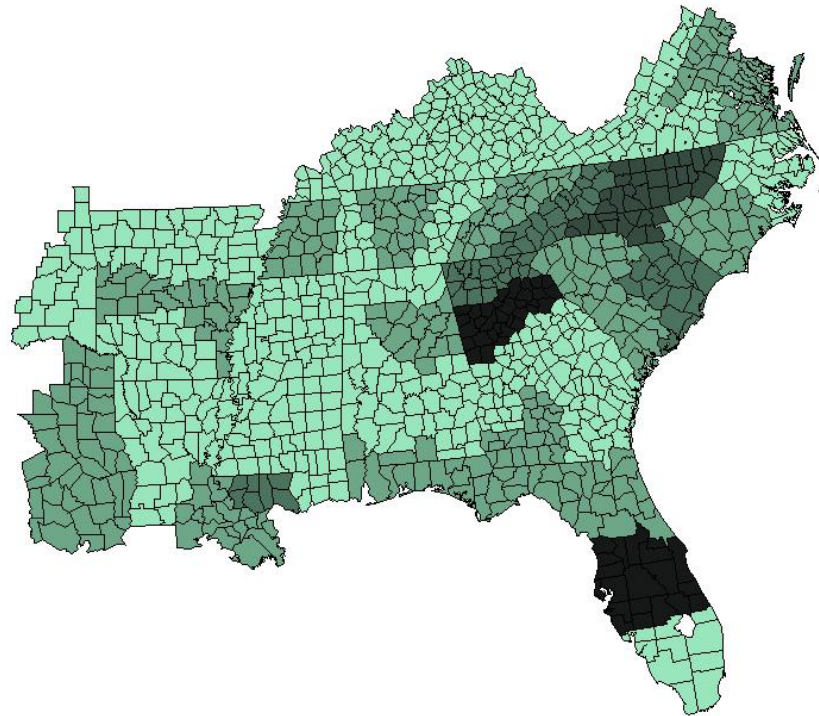
(b) Recession/recovery scenario



Timberland

Annual Timberland Loss

2005–2025



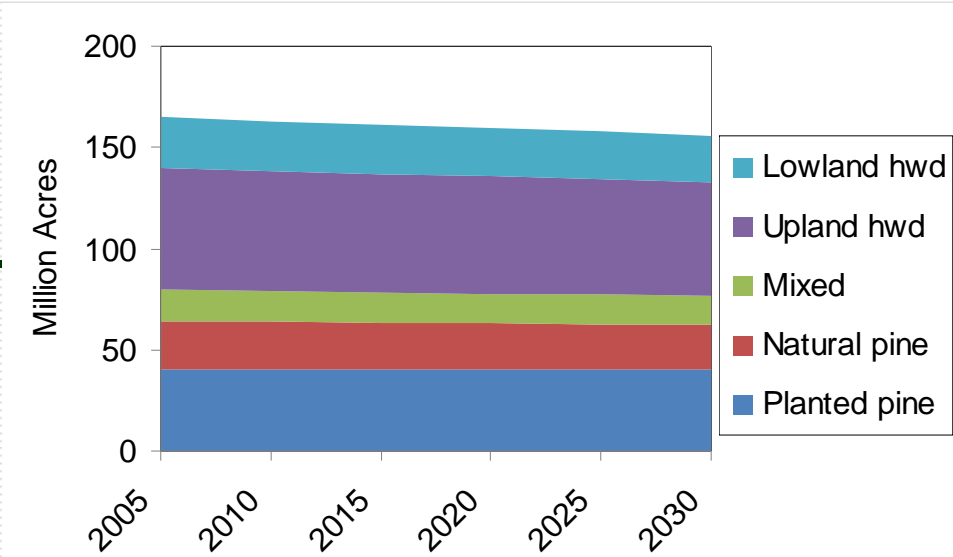
SGSF 2008

%/yr  < .3%  < .6%  < .9%  < 1.2%  < 1.5%

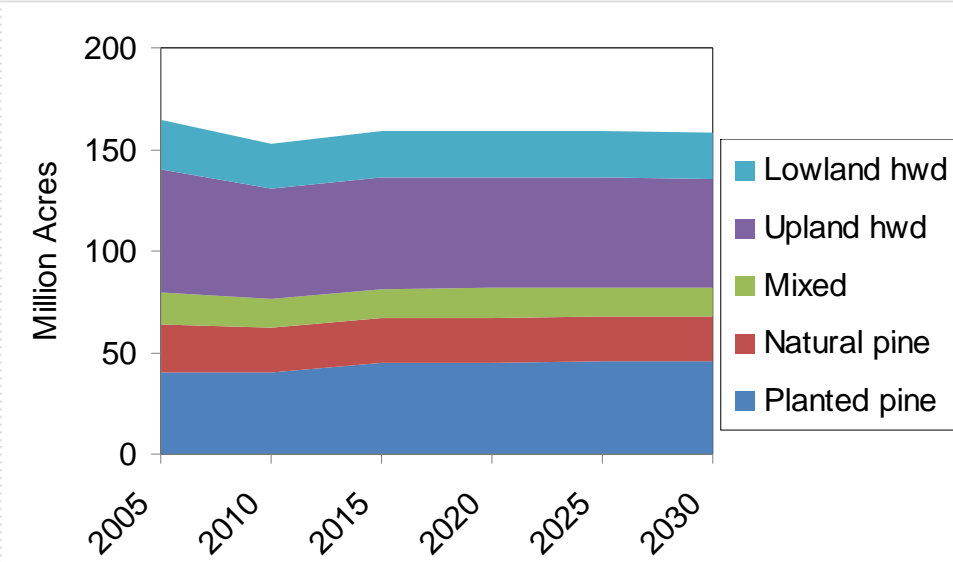
SOFAC 8/18/2009



Timberland



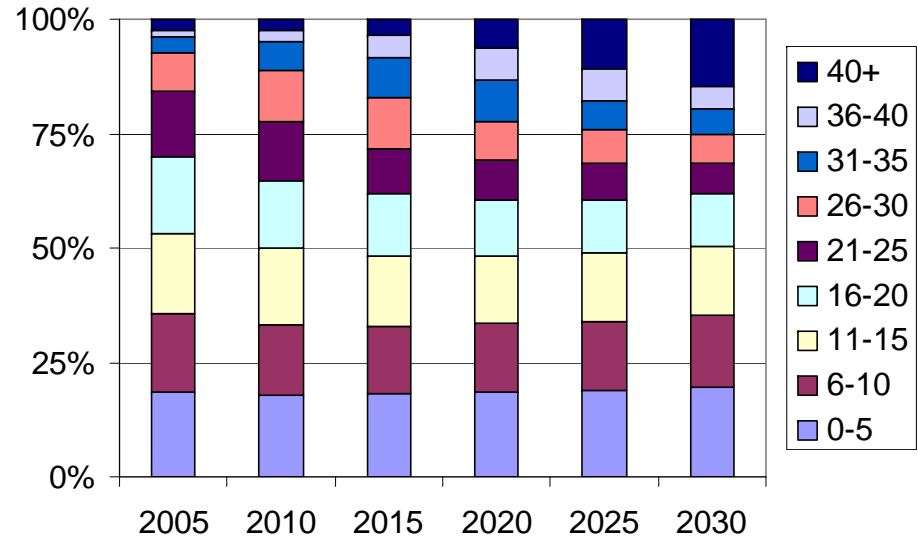
(a) Base scenario



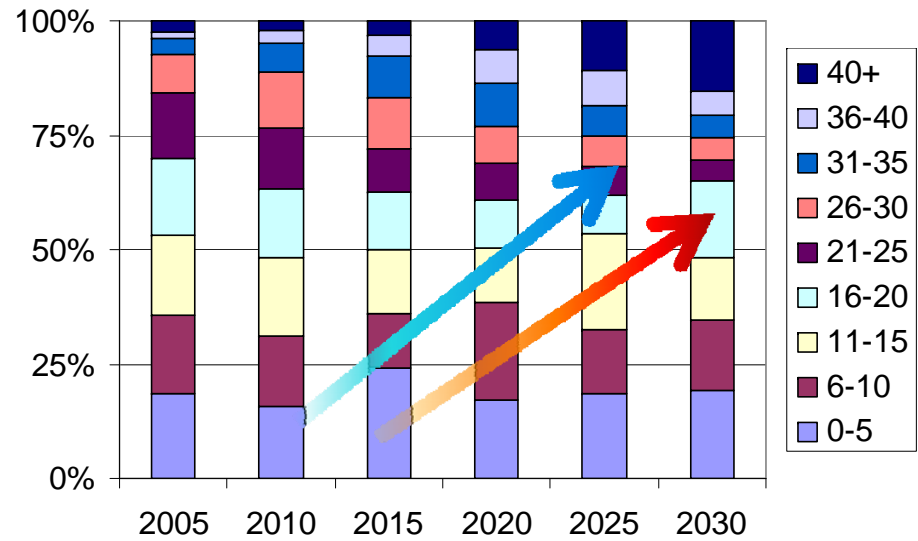
(b) Recession/recovery scenario



Plantation Age Class Distribution



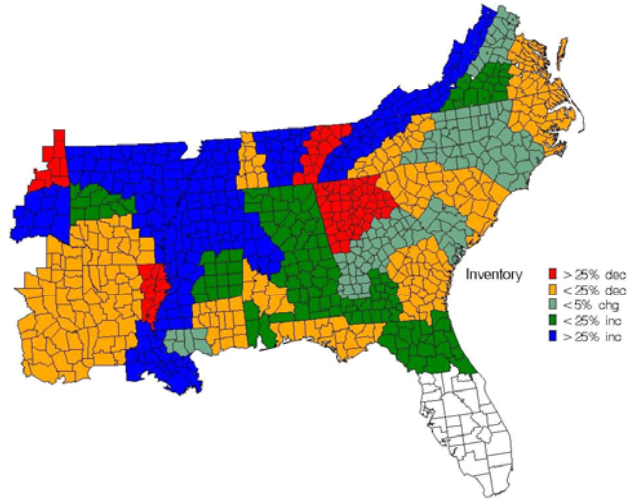
(a) Base scenario



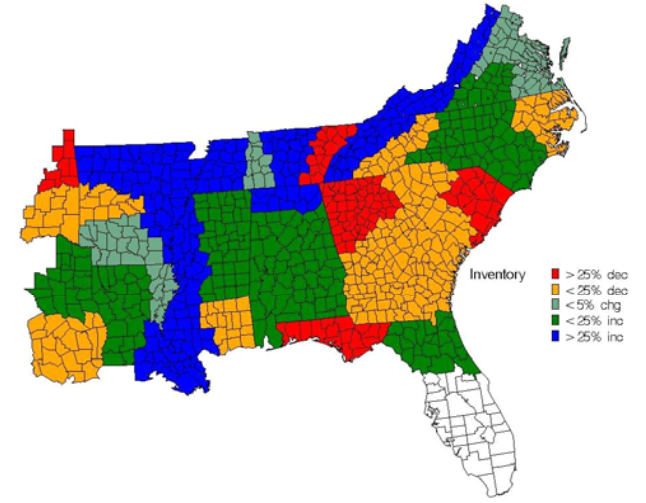
(b) Recession/recovery scenario



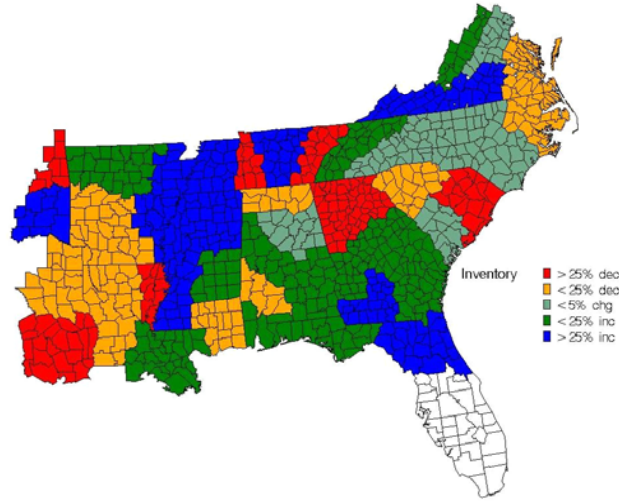
Pine Product Inventory Shifts



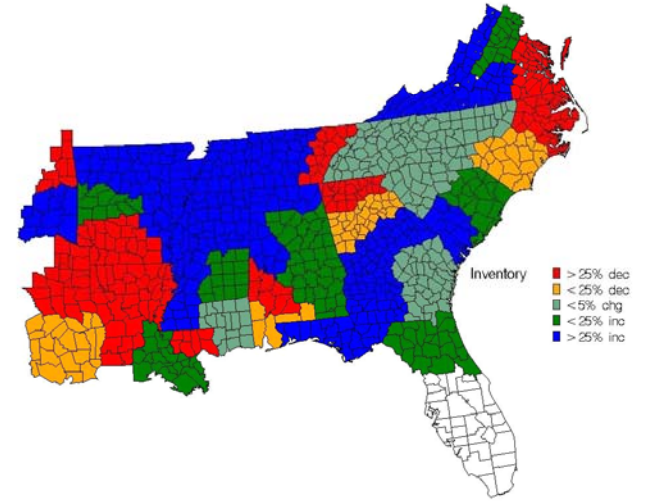
(a) Pine pulpwood inventory change 2005-2030



(b) Pine small sawtimber inventory change 2005-2030



(c) Pine sawtimber inventory change 2005-2030



(d) Pine large sawtimber inventory change, 2005-2030



Next Steps *(from last year)*:

- Priorities for the upcoming year
 - **Implement age class 3 merchandizing**
 - Regional biomass supply projections
 - Demand from Duke/RTI
 - Pinchot Institute
 - Heinz Foundation
 - Contract with Ray-MOU w/USFS
 - SAS code conversion to db3
 - **Validation of projection**
 - **Decompose acre, growth, removal change**
 - Will present biomass and elasticity results at IUFRO Forest Sector Modeling Conference in November



Next Steps *(this year)*:

- Priorities for the upcoming year
 - Implement age class 3 merchandizing
 - Real-time biomass utilization adjustments
 - Ray Sheffield – Projection Validation
 - John Coulston – Availability Analysis
 - Grad Students
 - Add carbon accounting to SRTS output
 - Carbon-Renewable Energy Tradeoffs
 - Integrated Conversion Economics
 - Availability



Next Steps *(this year)*:

- Priorities for the upcoming year
 - Renewable Energy
 - Christopher Galik – Duke
 - Brent Sohngen – OSU
 - Robert Beach – RTI
 - Karen Abt – USFS



QUESTIONS