FUTURE WOOD SUPPLY

UPDATED ASSESSMENT AFTER THE 2014 ICE STORM

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OUTLINE

- Review of the 2014 Ice Storm
  - Storm Impact
  - Damage Assessment

- Resource Review: Standing Inventory at time of ice storm event and current market conditions

- SRTS Modeling
  - Review of 2012 Study
  - Assessment of Ice Storm Damage on Future Timber Supply

Ice storm wallops Southeast, stranding drivers, cutting power

By Chelsea J. Carter, CNN
Updated 2:31 AM ET, Thu February 13, 2014

Concerns over ice storm power outages 01:13

Story highlights

NEW: More than 729,000 without power in Southeast, utilities say

More than 4,100 flights are canceled for Thursday

Get off the roads, and stay off.

That was the message in Georgia and the Carolinas as a snow and ice storm swept through Wednesday, bringing some of the Southeast's most populous cities to a standstill.

Weathering the storm

Smarten up before taking on bad weather
To understand how human nature sometimes doesn't heed winter weather warnings, listen to how Deanna Hunt didn't listen.

Snow vs. ice
A foot of snow may look big and bad, but it's a bunch of fluff compared to a solid inch of ice.

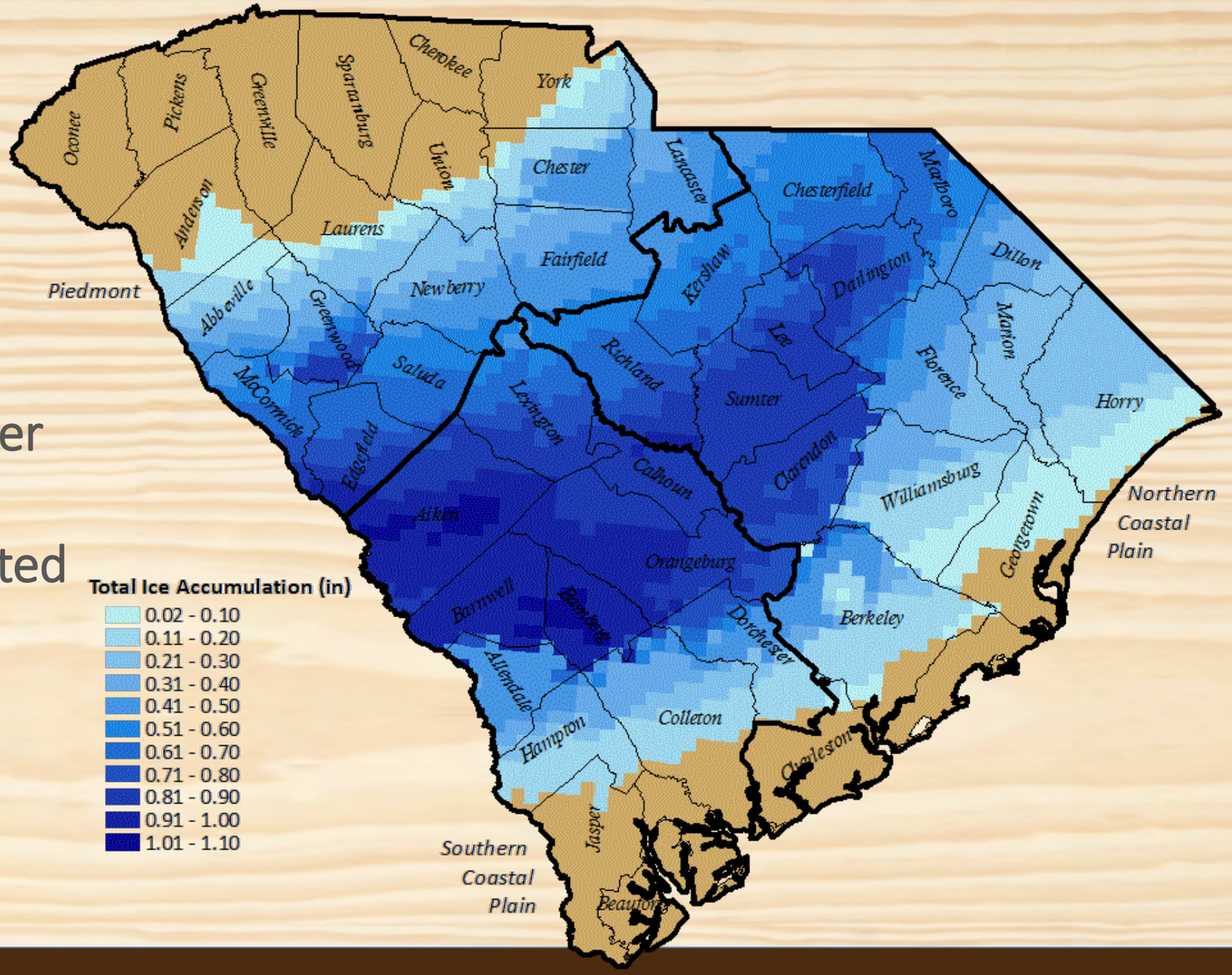
Lessons from stranded snow survivors
Residents who have been stranded on icy interstates and at strangers' homes during a winter storm share their stories.

What to do when stuck in a snowbound car
Snow can be a delight -- but only when you're admiring it

2014 ICE STORM | Storm Impact

Ice Storm Impacts

- 40 counties experienced significant icing
- 350,000 homes without power
- 1 million yards of debris created

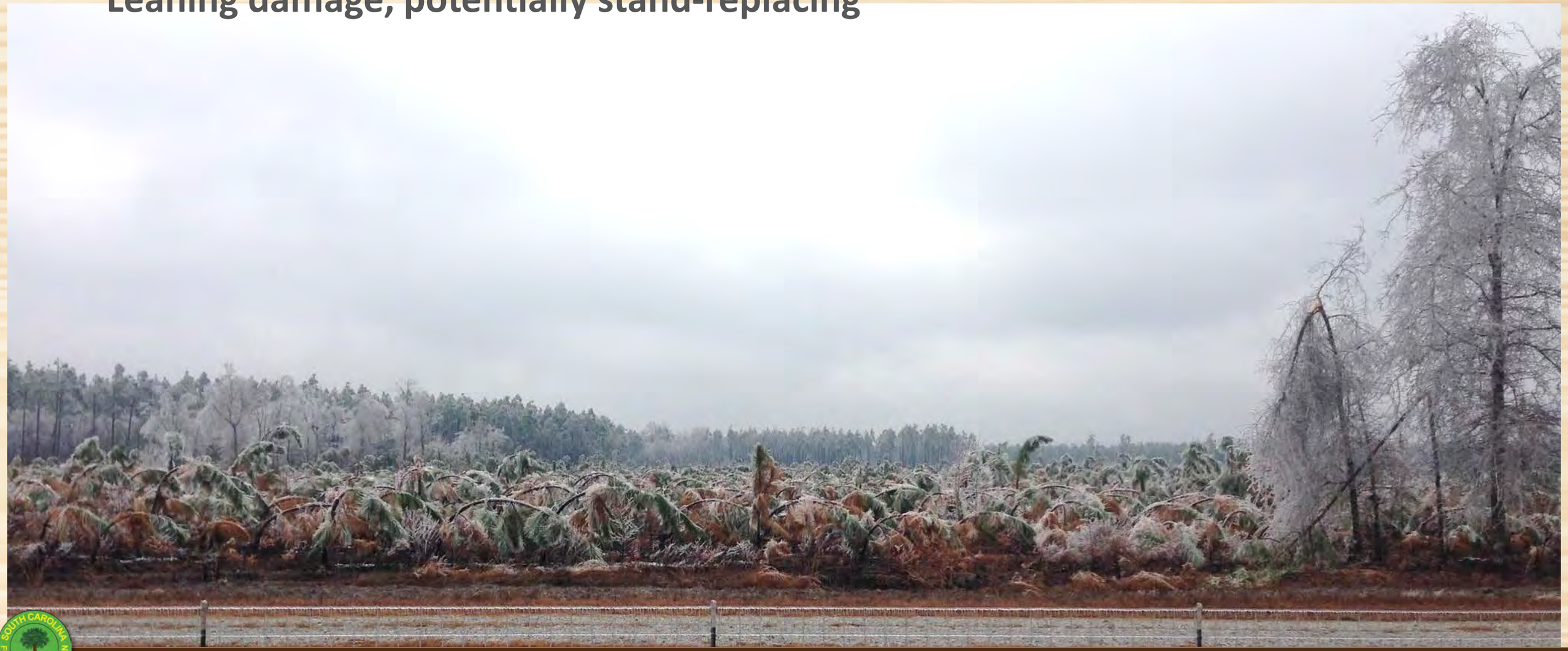


2014 ICE STORM | Storm Impact

Leaning damage, recoverable

2014 ICE STORM | Storm Impact

Leaning damage, potentially stand-replacing



2014 ICE STORM | Storm Impact

Tops broken, stems down

2014 ICE STORM | Storm Impact

Impact on Forest Resources

- 1.5 million acres of forest impacted
- $360 million dollars worth of damage
- 24 counties required unscheduled harvesting

OFFICE OF THE STATE FORESTER

FOREST DISASTER DECLARATION

WHEREAS, an ice storm struck certain forestlands of South Carolina on February 11 through 13, 2014, *and*;

WHEREAS, the impacted area includes a 70-mile wide band extending from Edgefield, Aiken, Barnwell and Allendale Counties on the Savannah River to Dillon and Horry Counties on the North Carolina border, *and*;

WHEREAS, the timber damage is estimated above $360 million on 1.5 million acres of forestland, *and*;

WHEREAS, many forest landowners in twenty-four South Carolina counties must now implement unscheduled harvests in an effort to salvage some value from their damaged forests, *and*;

WHEREAS, significantly damaged trees must be harvested promptly to avoid natural deterioration and market degradation, *and*;

WHEREAS, such harvests can only be achieved through active involvement and cooperation of South Carolina's entire forestry community, *now*;

THEREFORE, I, as State Forester of South Carolina, do declare a forest disaster in the affected counties, and call upon all forestry interests to work together to facilitate prompt salvage and regeneration of the damaged resource.

Given under my hand and seal this 5th day of March, 2014.

Henry E. Kodama

Henry E. Kodama
State Forester

2014 ICE STORM | Damage Assessment

Damage Assessment

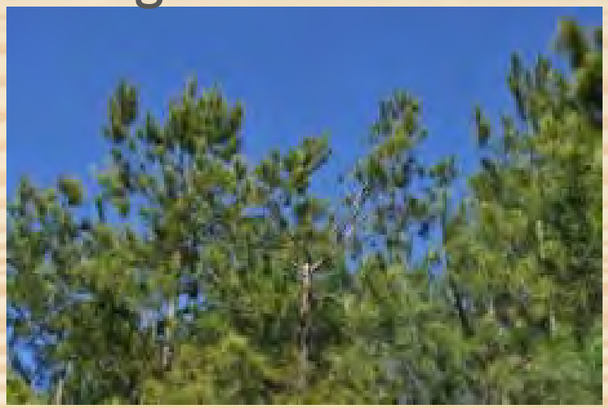
South Carolina Forestry Commission developed quick response survey techniques

- Utilized existing FIA plot allocations
  - Modified plot design/location to increase response time
- Assessed 20 trees per plot
- Plot damage condition classes
  - *None* or *Light* damage – no salvage needed
  - *Moderate* damage – may warrant a salvage harvest to remove damaged trees
  - *Heavy* damage – salvage harvest or clearcut and replanting will most likely be needed

2014 ICE STORM | Damage Assessment

Damage Classifications

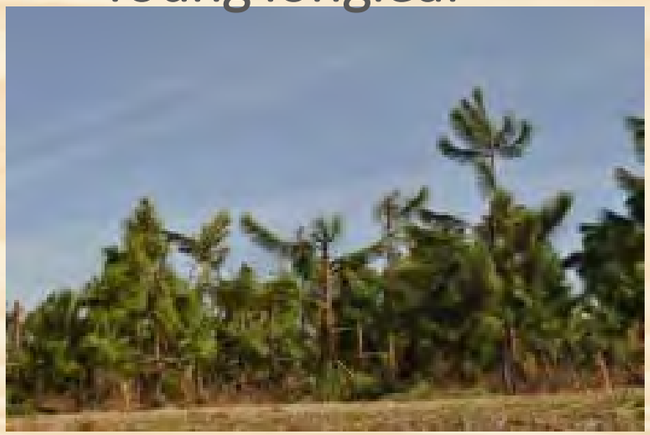
Light damage



Heavy damage, recently thinned loblolly

Heavy damage

Moderate damage, Young longleaf

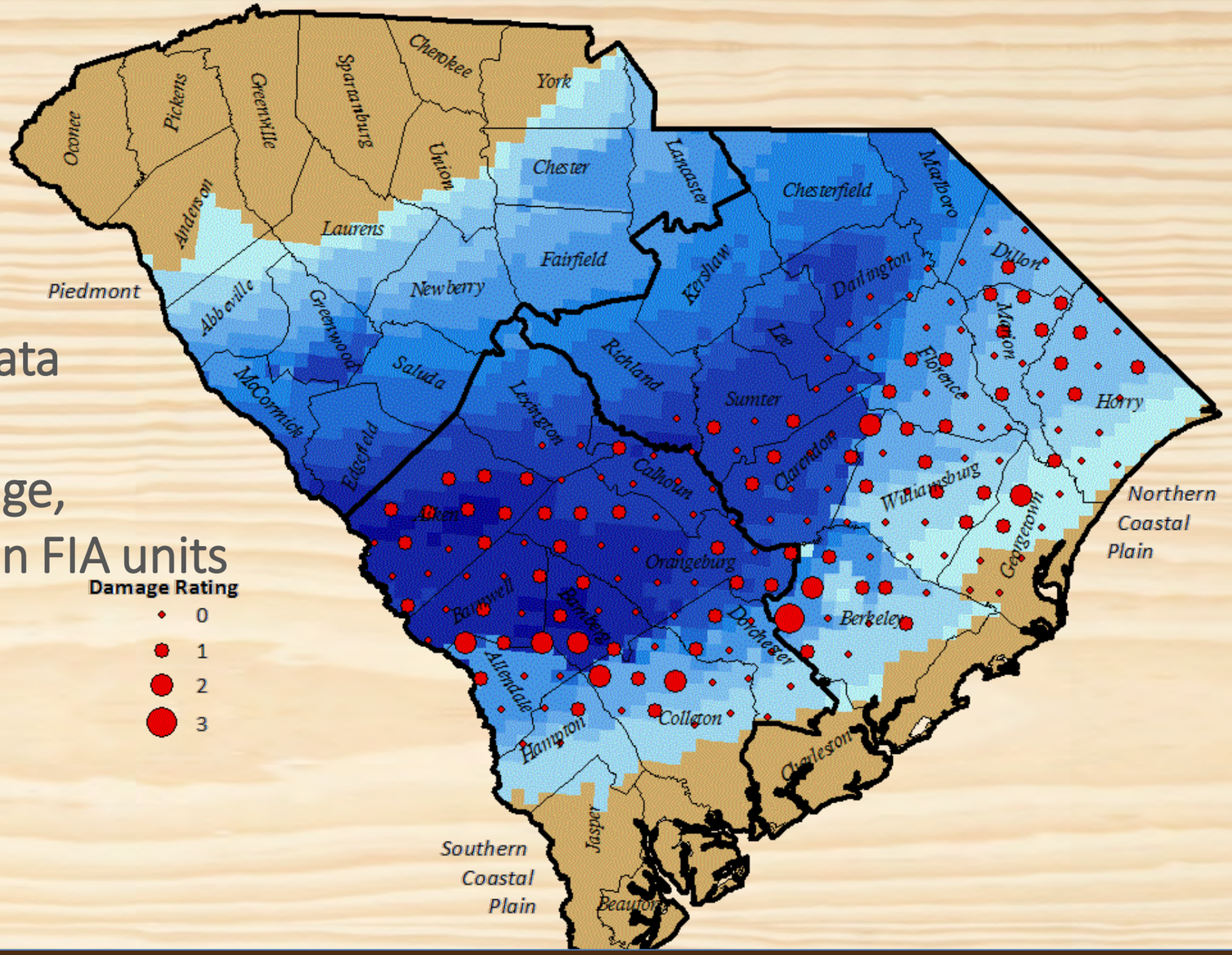


Moderate damage, loblolly

2014 ICE STORM | Damage Assessment

Damage Assessment

- 248 sample plots
- Aerial survey to adjust plot data
- 22.2 millions tons total damage, divided between Coastal Plain FIA units
  - SCP - 11.13 million tons
  - NCP – 11.06 million tons



2014 ICE STORM | Damage Assessment

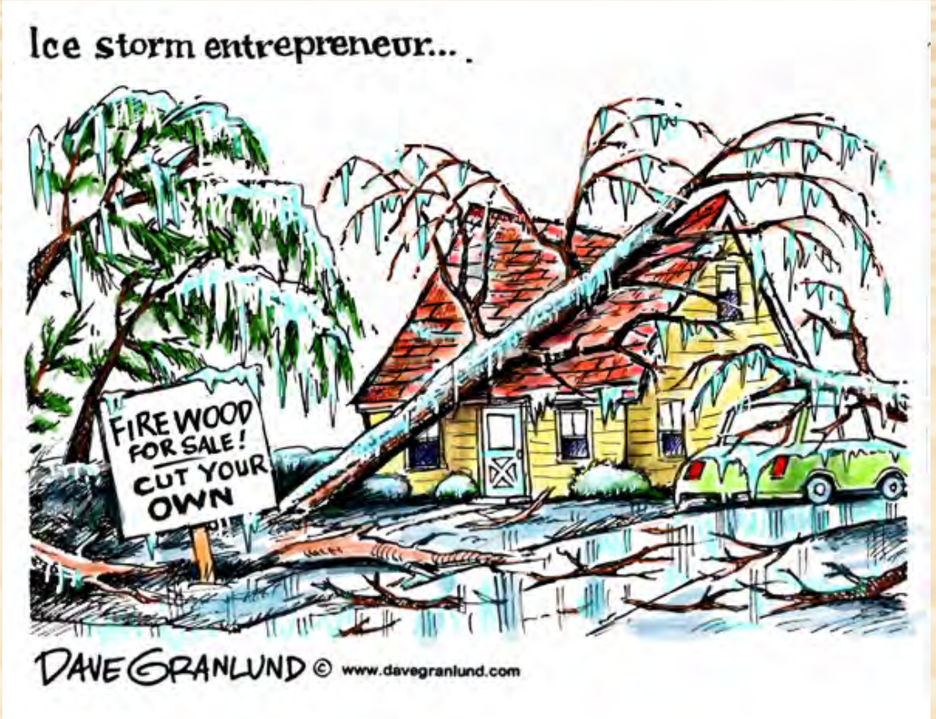
Damage estimates, per county, based on aerial and field observations.

	Pulpwood Volume	Sawtimber Volume	Value
County	**Cords**	**MBF (Int. Rule)**	**Dollars**
Aiken	331,470	132,441	$30,136,573
Allendale	171,953	107,065	$21,525,756
Bamberg	243,847	108,320	$24,085,755
Barnwell	244,248	146,063	$29,994,166
Berkeley	666,839	273,340	$61,890,271
Calhoun	23,137	12,730	$2,638,283
Clarendon	172,592	60,453	$14,349,297
Colleton	392,658	174,078	$38,419,853
Dillon	32,521	17,232	$3,593,298
Dorchester	86,295	35,623	$8,009,218
Florence	138,614	64,366	$14,056,829
Georgetown	168,749	99,768	$20,568,895
Hampton	51,401	23,874	$5,204,545
Horry	118,509	53,329	$11,607,161
Marion	318,519	128,511	$28,729,983
Orangeburg	238,353	109,937	$23,901,489
Sumter	84,788	38,076	$8,320,827
Williamsburg	156,604	77,777	$16,656,788
Total	**3,641,097**	**1,662,983**	**$363,688,989**

2014 ICE STORM | Damage Assessment

Mill survey results

- 57 mills surveyed (5 out of state)
- Pulpwood highest use (57%)

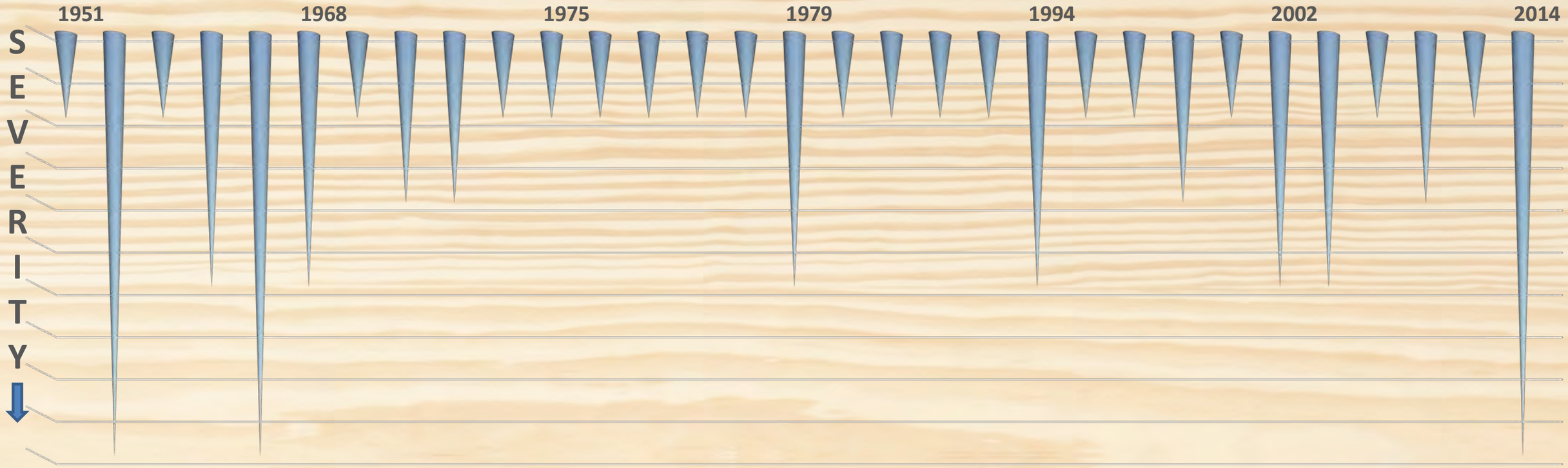


	Salvaged Softwood, Tons				
	Sawtimber	Chip-n-saw	Pulpwood	In-Woods Chips	Fuelwood
March	8,450	24,606	164,444	35,671	48,168
April	3,846	9,208	104,315	24,154	27,553
May	4,900	2,880	58,148	18,182	17,510
June	3,200	2,107	22,690	5,500	4,399
July	225	789	1,126	7,904	0
Total	20,621	39,590	350,723	91,411	97,630
	Total Softwood Salvage		599,975	(96.6% of all Salvage)	

	Salvaged Hardwood, Tons				
	Sawtimber	Chip-n-Saw	Pulpwood	In-Woods Chips	Fuelwood
March	0	0	5,320	1,406	2,992
April	0	0	2,150	450	1,906
May	0	0	1,800	500	1,892
June	0	0	1,000	500	659
July	0	0	0	0	0
Total	0	0	10,270	2,856	7,449
	Total Hardwood Salvage		20,575	(3.4% of all Salvage)	
			Grand Total:	**620,550 tons**	

2014 ICE STORM| Storm Background

Ice Storms in South Carolina, 1950-2014



Storm return interval and intensity is highly variable, however ice storm occurrences are a regular part of the disturbance regime for the Southeast.

2014 ICE STORM | Key Points

- Largest damage experienced in the smaller diameter classes
  - Recently thinned stands

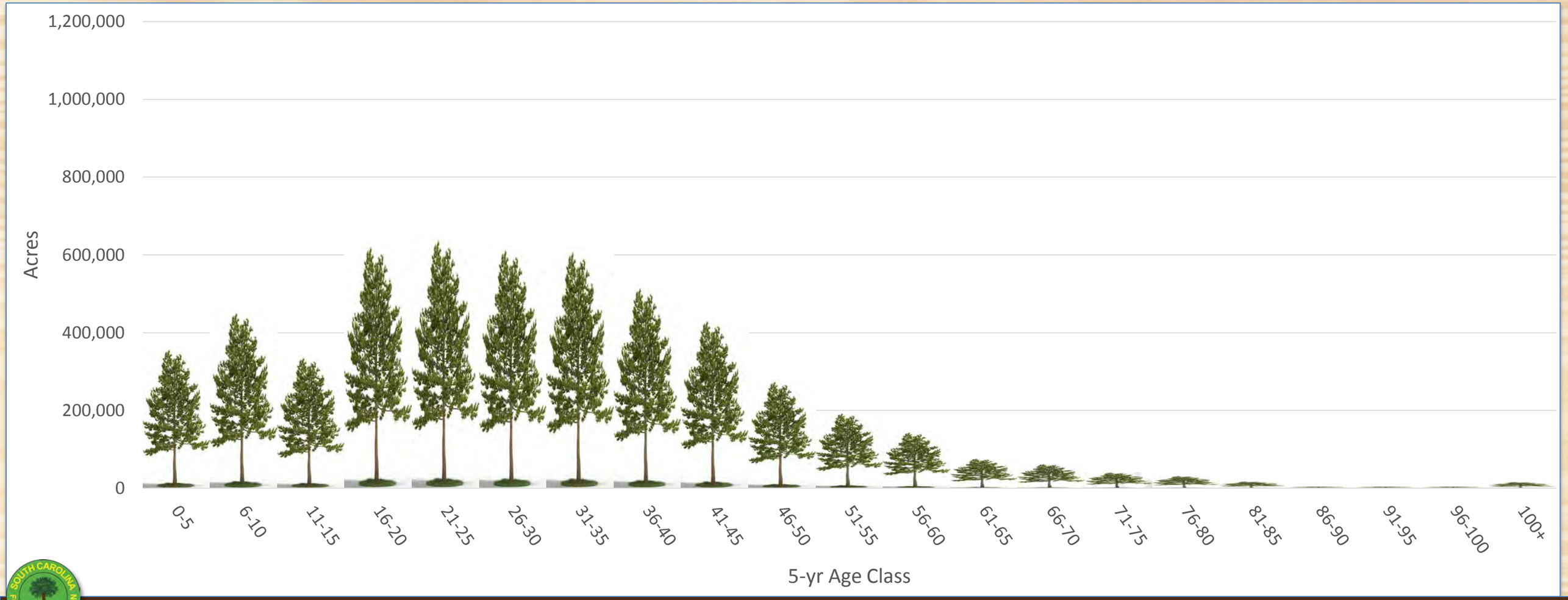
Low utilization rates of damaged compared to other disturbance events
  - ~ 3% overall
  - Higher for SYP

- Unharvested damaged wood unsuitable for most purposes by August, 2014

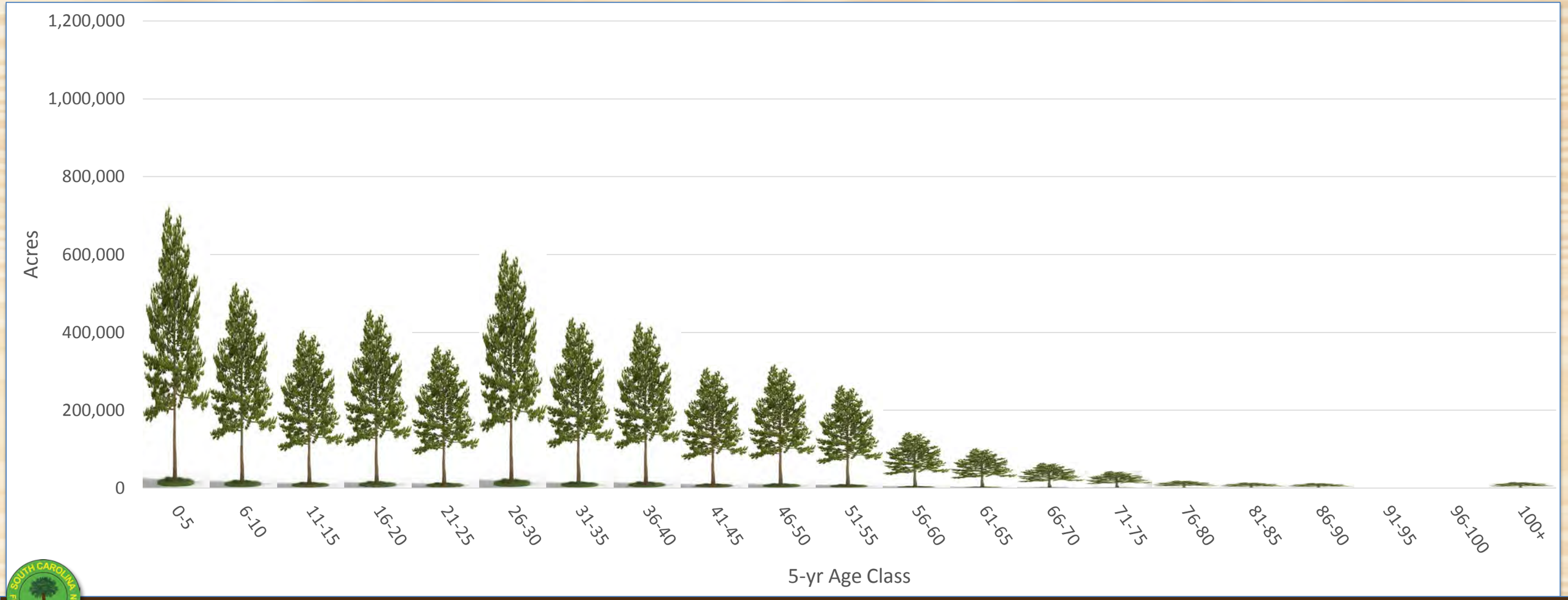
- Total losses equal to one year of harvest removals (2.6% total inventory)

- 25,000 to 30,000 acres required to be replanted

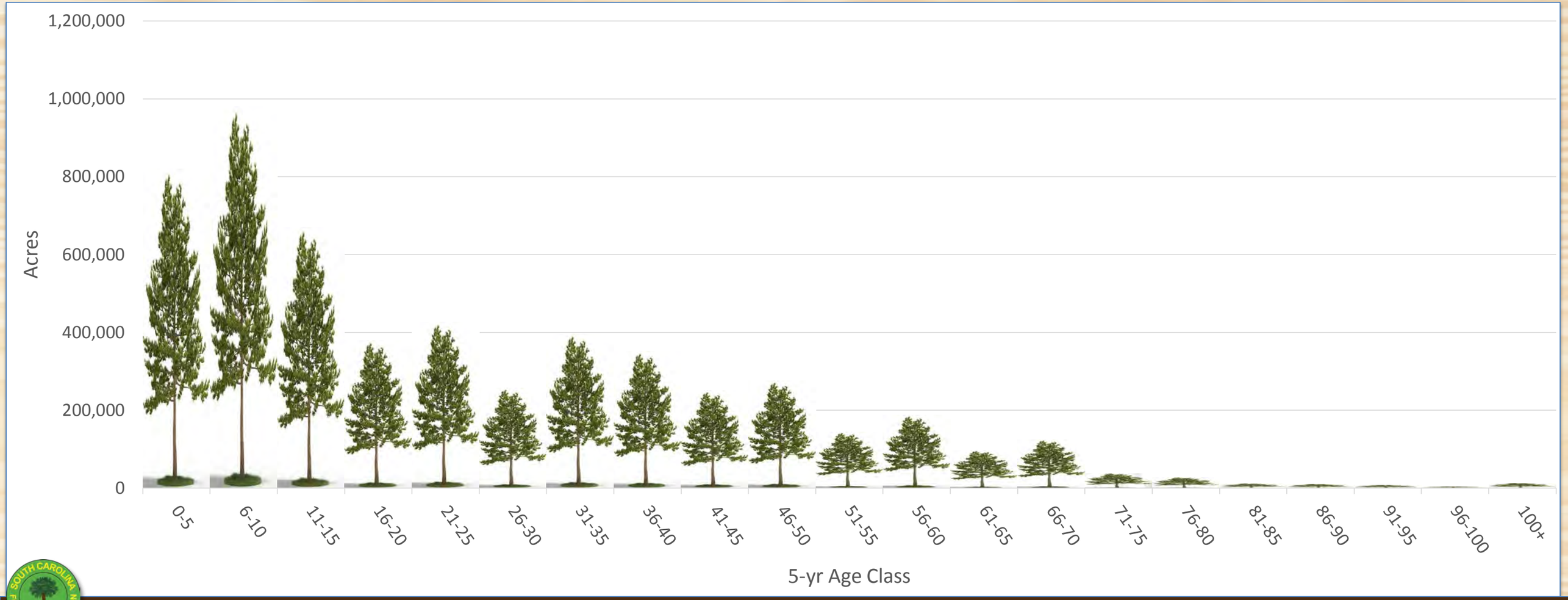
Timberland Acreage of Southern Yellow Pine, SC - 1978



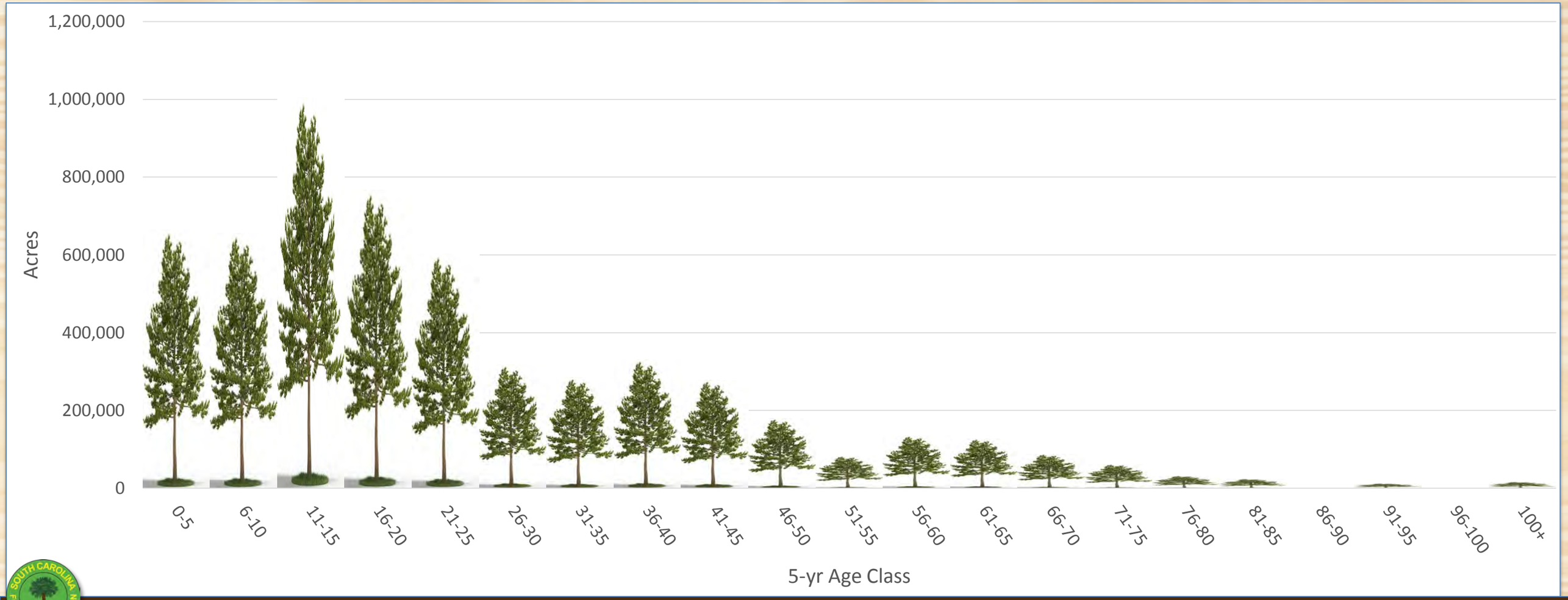
Timberland Acreage of Southern Yellow Pine, SC - 1986



Timberland Acreage of Southern Yellow Pine, SC - 1993

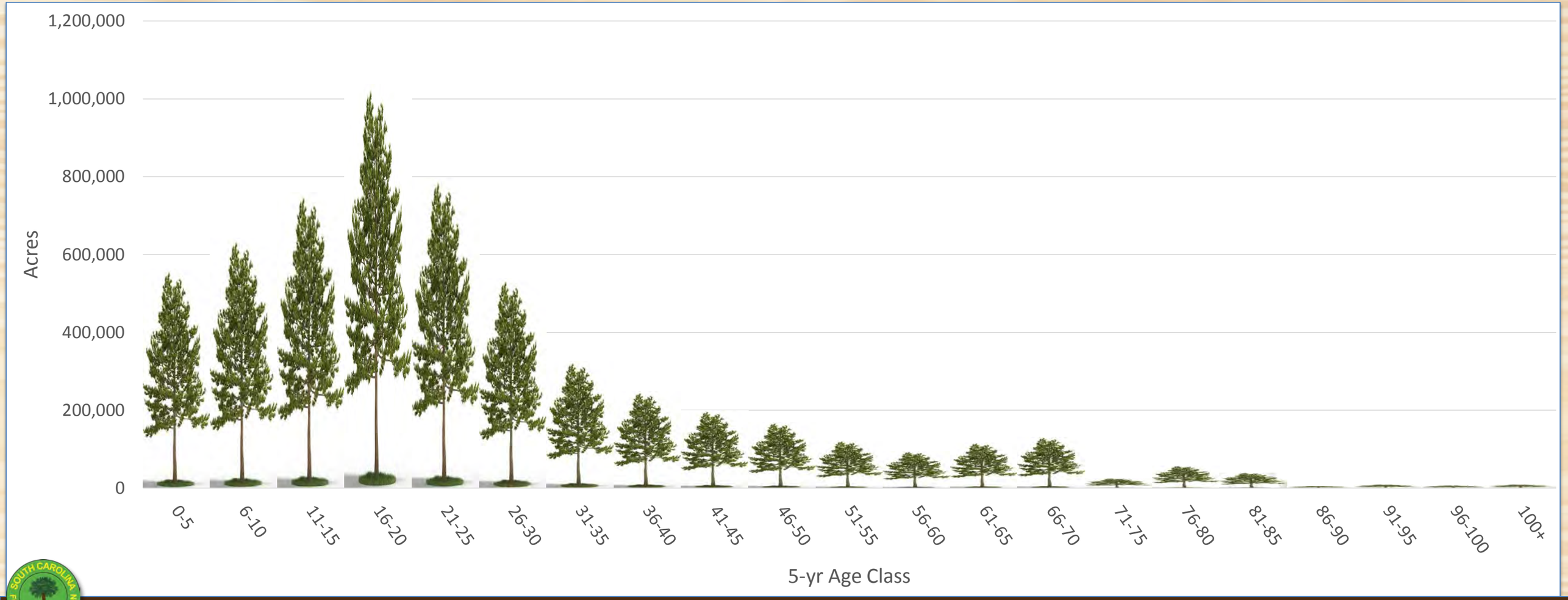


Timberland Acreage of Southern Yellow Pine, SC - 2001

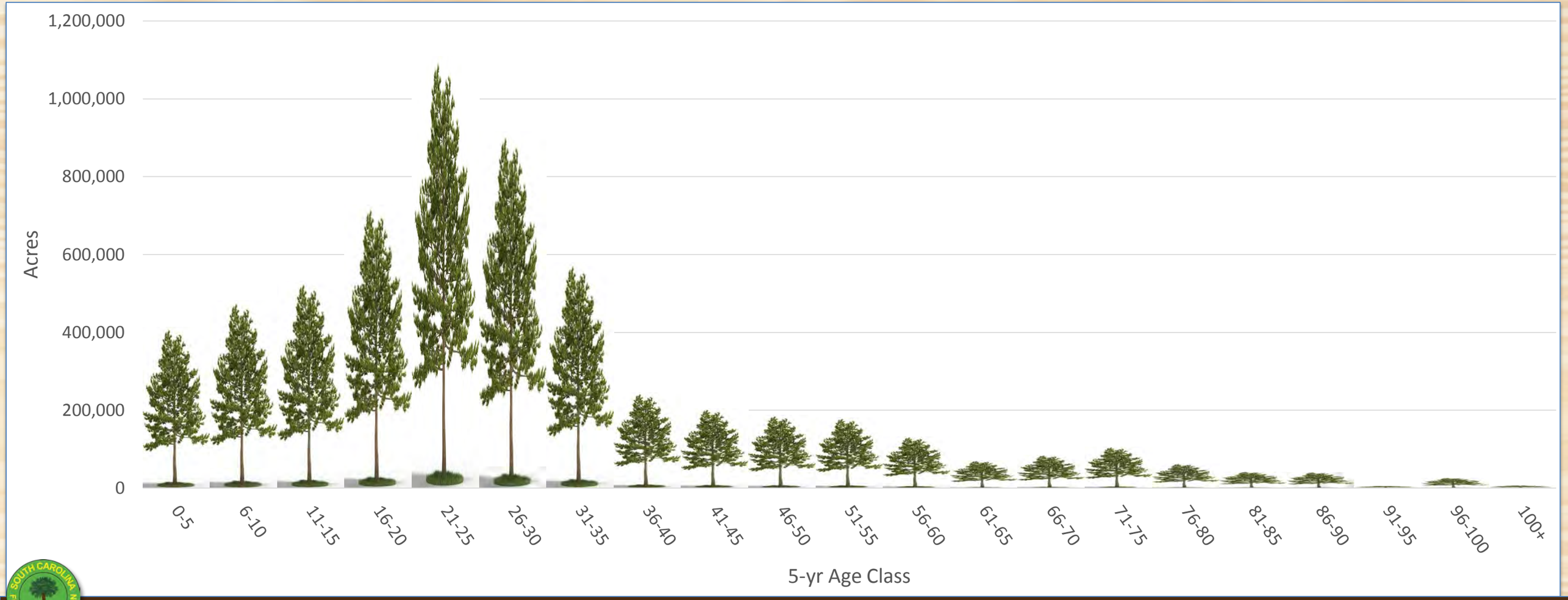


Resource Review | Wall of Wood

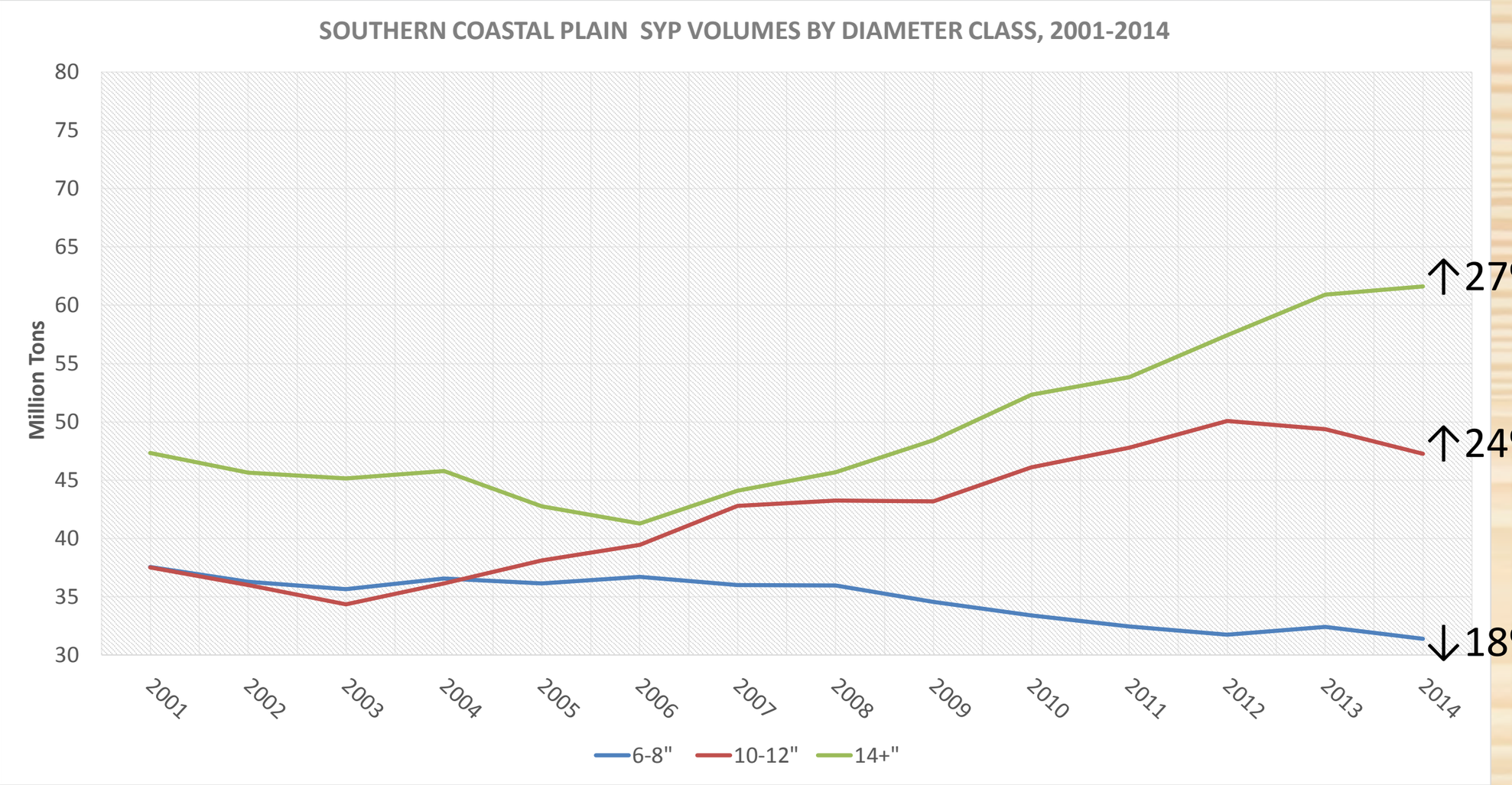
Timberland Acreage of Southern Yellow Pine, SC - 2006



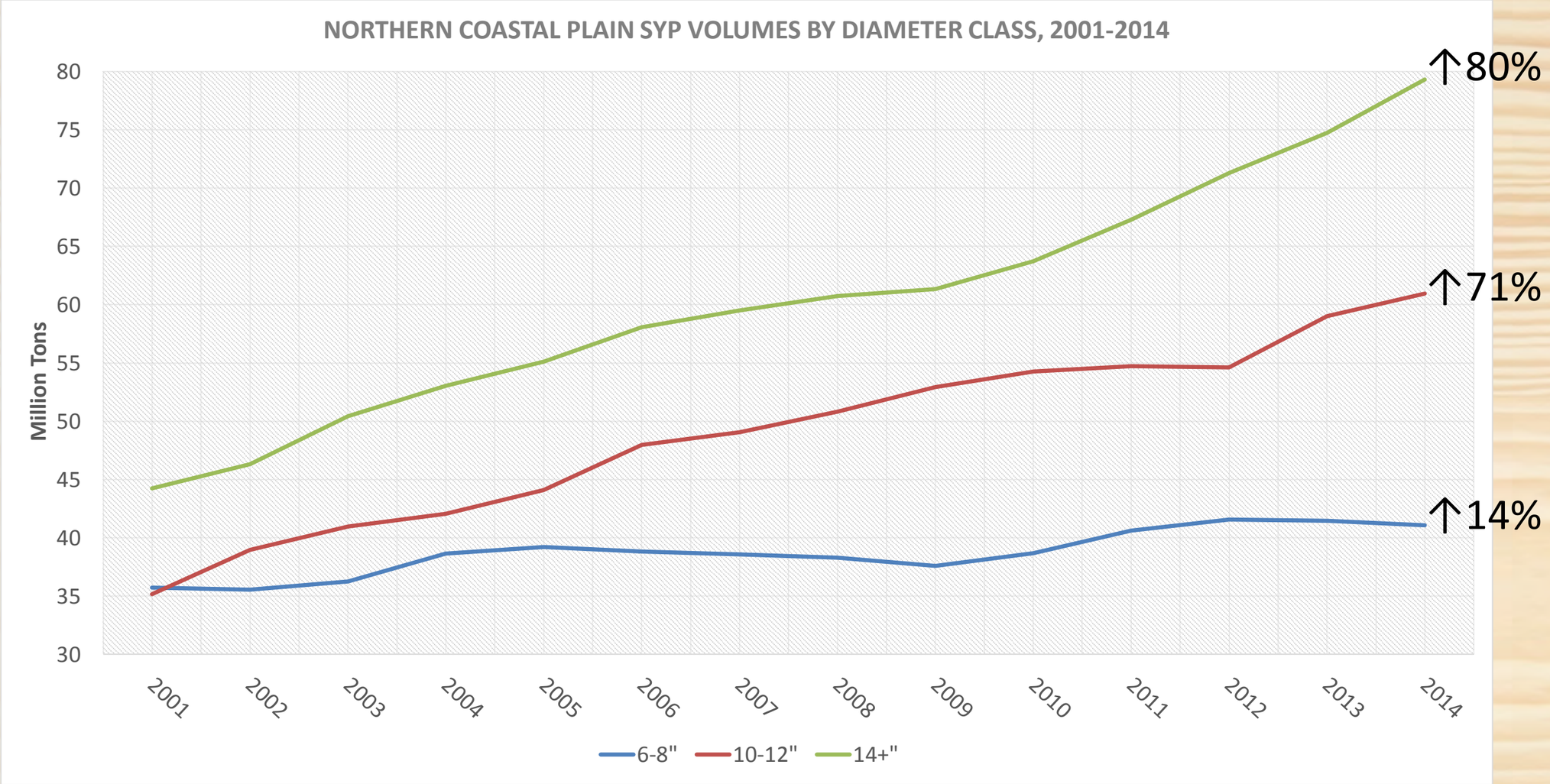
Timberland Acreage of Southern Yellow Pine, SC - 2014



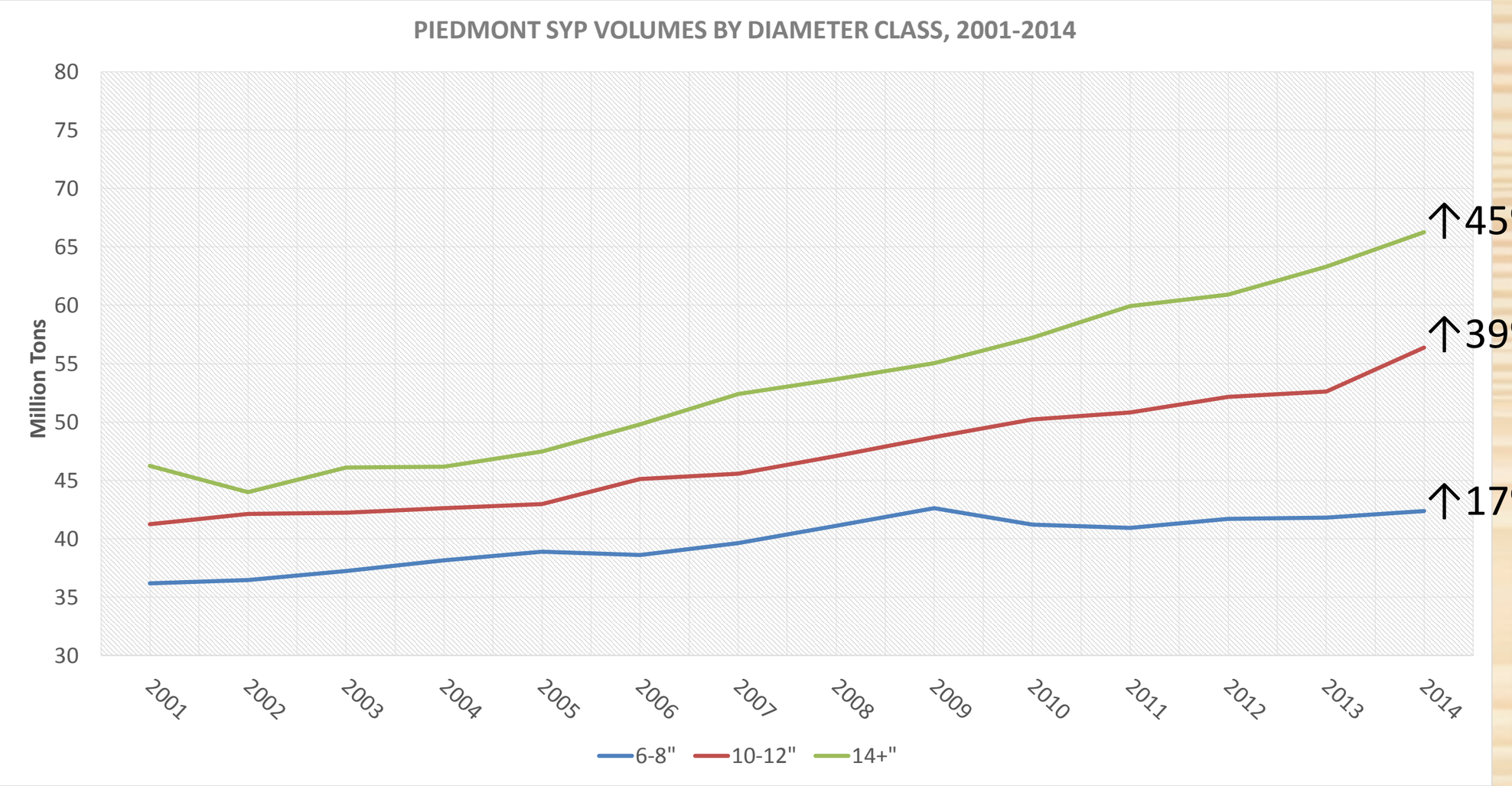
Resource Review | FIA Unit Analysis



Resource Review | FIA Unit Analysis



Resource Review | FIA Unit Analysis



Resource Review| TPO 2013

Table 1—Output of industrial products by product and species group, South Carolina, 2011 and 2013*

Product and species group	Year 2011	Year 2013	Change	Change
	- - - - - thousand cubic feet - - - - -			percent
Saw logs				
Softwood	157,296	182,933	25,637	16.3
Hardwood	14,375	17,267	2,892	20.1
Total	171,671	200,200	28,529	16.6
Veneer logs				
Softwood	26,267	30,592	4,325	16.5
Hardwood	3,895	2,803	-1,092	-28.0
Total	30,162	33,396	3,234	10.7
Pulpwood				
Softwood	305,076	285,160	-19,916	-6.5
Hardwood	76,935	69,807	-7,128	-9.3
Total	382,011	354,968	-27,043	-7.1

Product and species group	Year 2011	Year 2013	Change	Change
Other industrial**				
Softwood	60,877	83,051	22,174	36.4
Hardwood	1,385	3,456	2,071	149.5
Total	62,262	86,506	24,244	38.9
All Industrial				
Softwood	549,516	581,736	32,220	5.9
Hardwood	96,590	93,334	-3,256	-3.4
Total	**646,106**	**675,070**	**28,964**	**4.5**

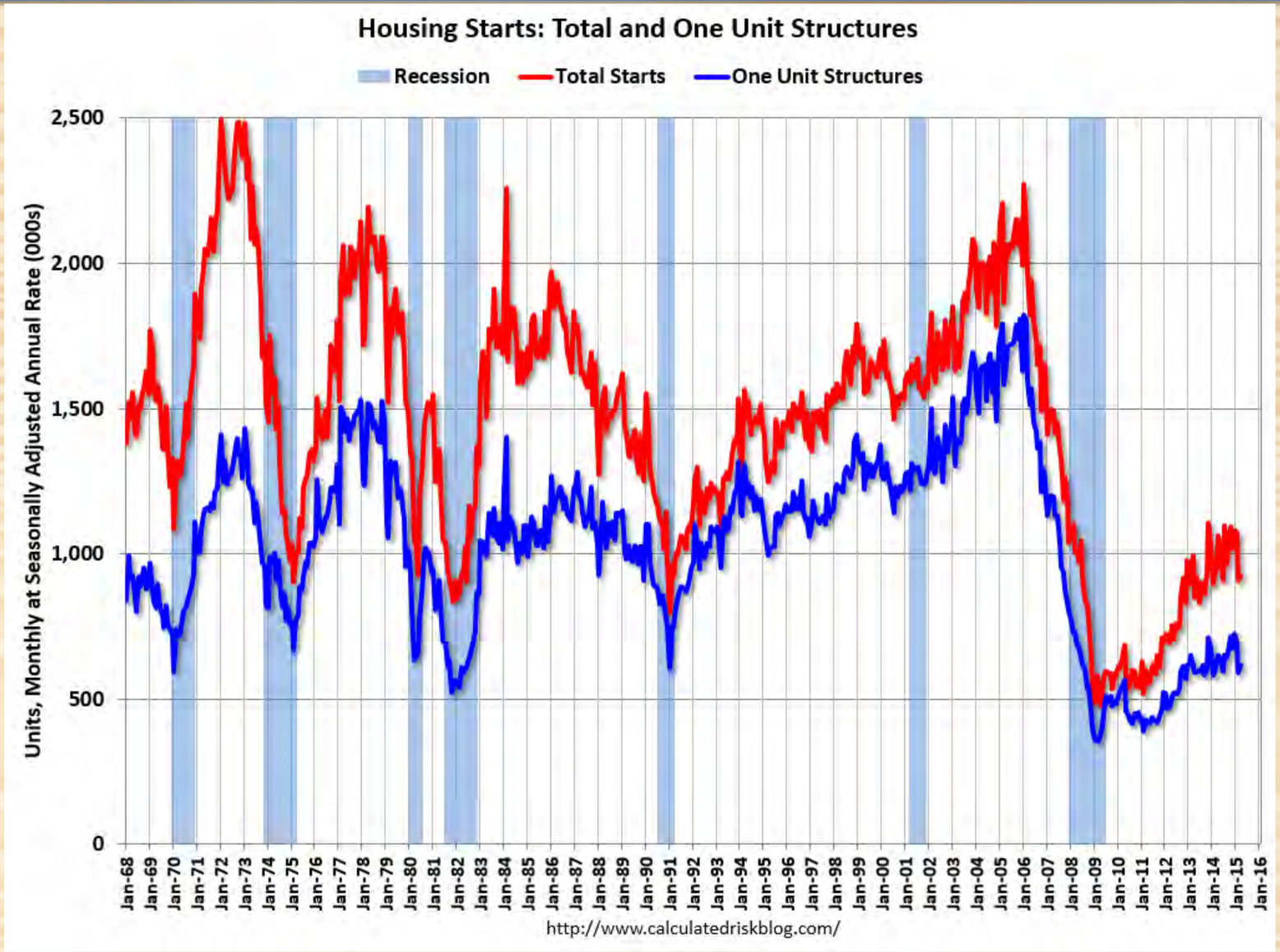
% Increase

*Export volumes estimated from 2011 values

** Includes composite panels, poles, posts, mulch, log homes, industrial fuelwood, and all other industrial products.

Housing Recovery

- Recovery slow, but improving
- More multi-unit demand
- Short supply (5.1 months)
- Strict lending rules



Resource Review | Key Points

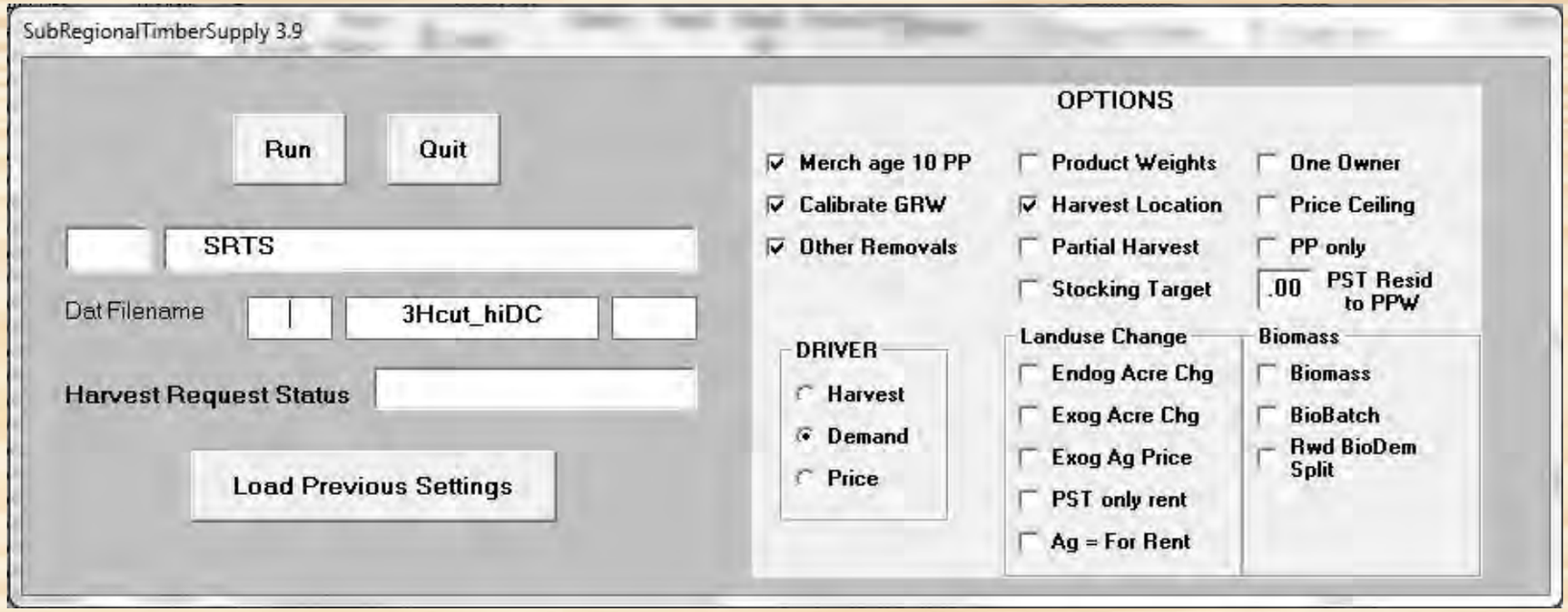
- Wall of Wood maturing, 21-25, 26-30 year age classes
  - CNS and Sawtimber size classes
- Pressure on smaller diameter size classes (SYP)
  - Southern Coastal Plain (Northern Coastal Plain showing limited growth)
- Increasing volume statewide (dominated by larger diameter classes)
- Market recovering, but slowly

SRTS | Background

Sub-Regional Timber Supply Model

Developed by Abt, Cubbage, NC State University

Integrates currently available spatially explicit forest resource data from the USDA Forest Service, Forest Inventory and Analysis (FIA) program and economic theory to model timber supply and demand in the South.



SRTS | 2012 Study

2012 Study – a 20/15 Program Project
(Abt, Adams, Houston and Lupold)

- Model ran under varying demand scenarios products
  - Low - Housing Recovery
  - High – Housing Recovery plus additional removals

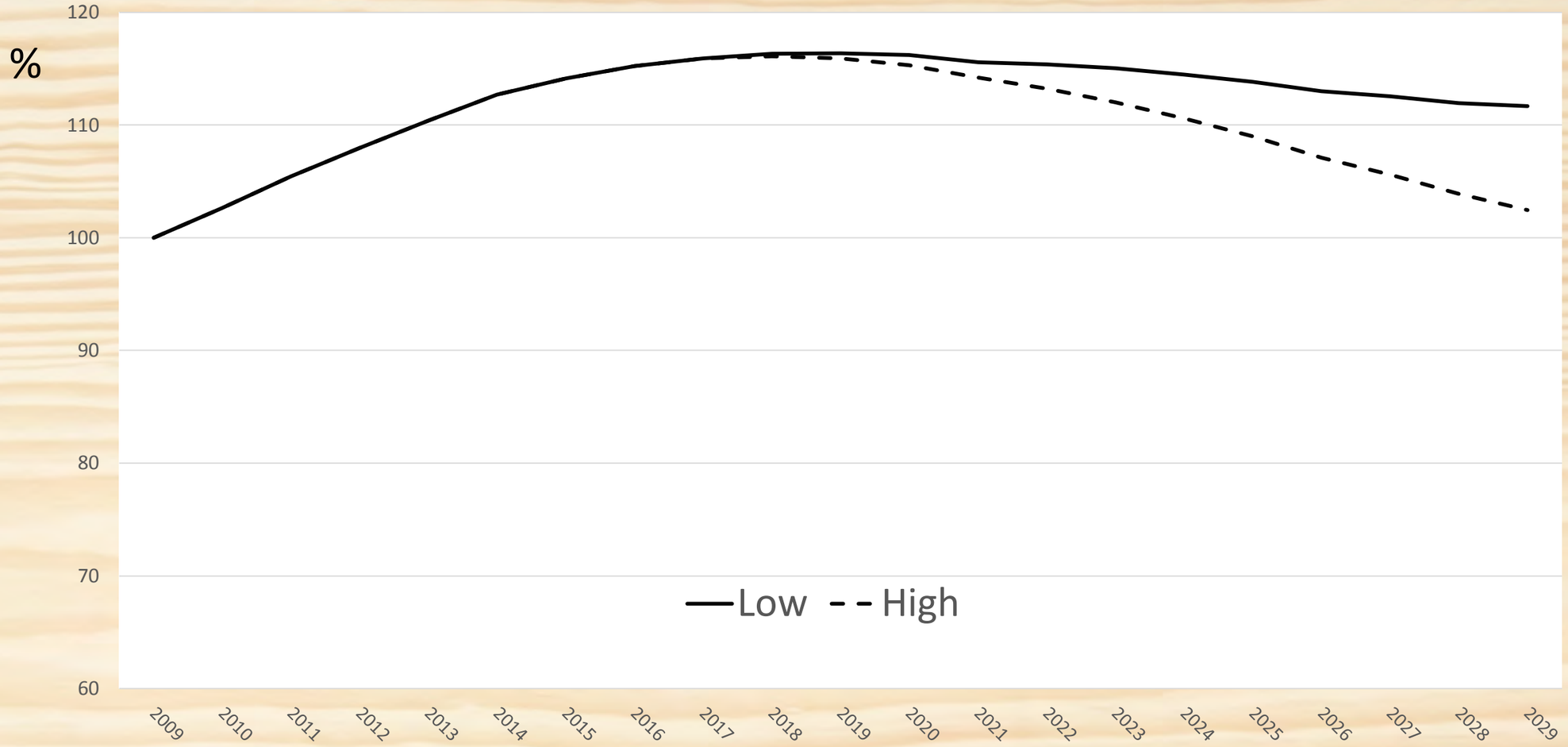
- Design utilized 7 different forest products
  - 4 Pine (Pulp, CNS, Sawtimber, Large Sawtimber)
  - 3 Hardwood (Pulp, Small Sawtimber, Sawtimber)
  - Results were grouped into Small and Large Diameter classes

- Based on 2012 FIA Data

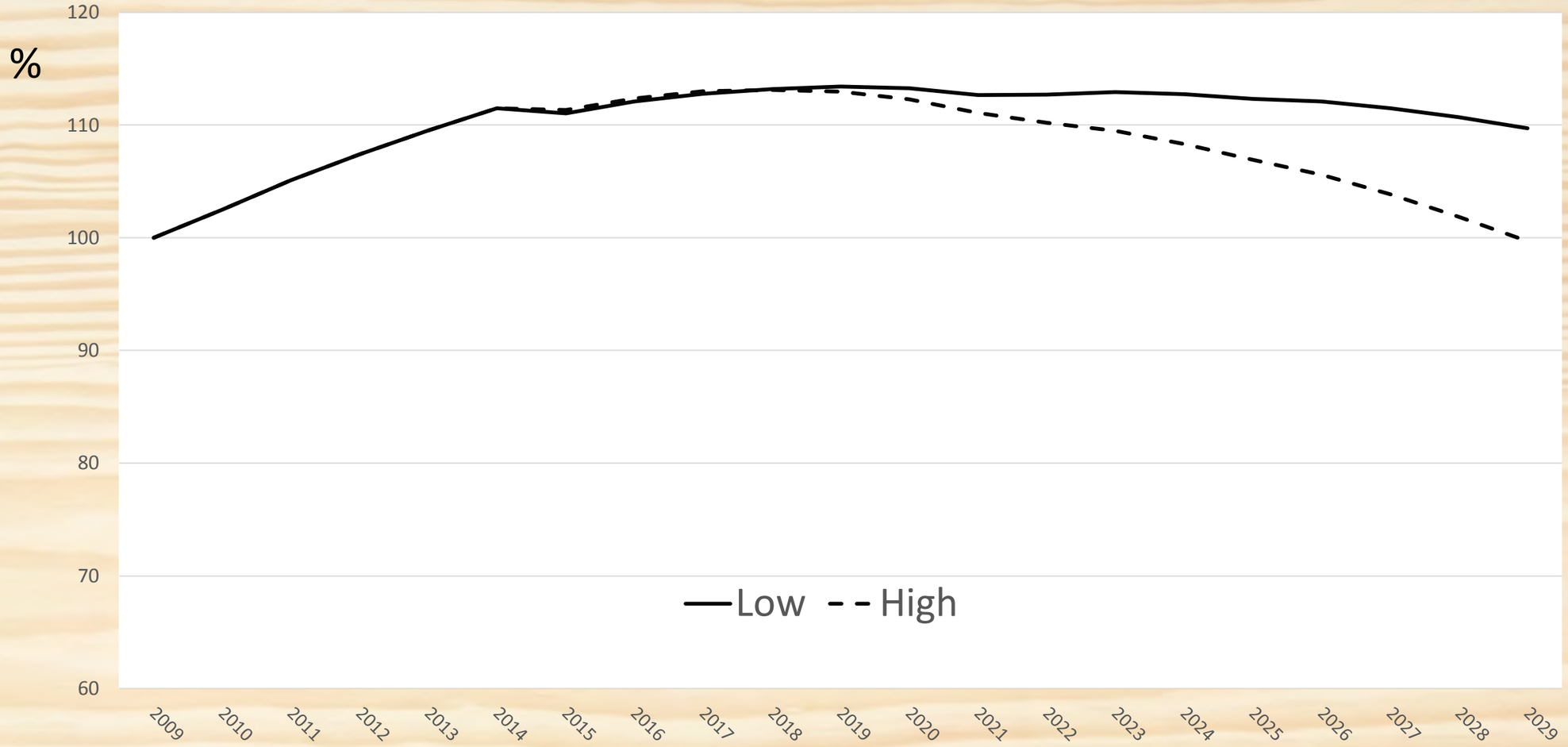
2012 Study Results

- Total pine inventory will be higher in 20 years
  - Large variation across size classes
  - Highest increase in large diameter size classes
- Scarcity emerging in smaller diameter classes
  - May be more pronounced at FIA Unit level (SCP)
- Overall positive results across all demand scenarios
  - 20-22 millions tons harvest annually
  - 4-8 million tons of surplus

2012 Study Results, All Pine Products



Results for All Pine Products, with Removals from Ice Storm Loss

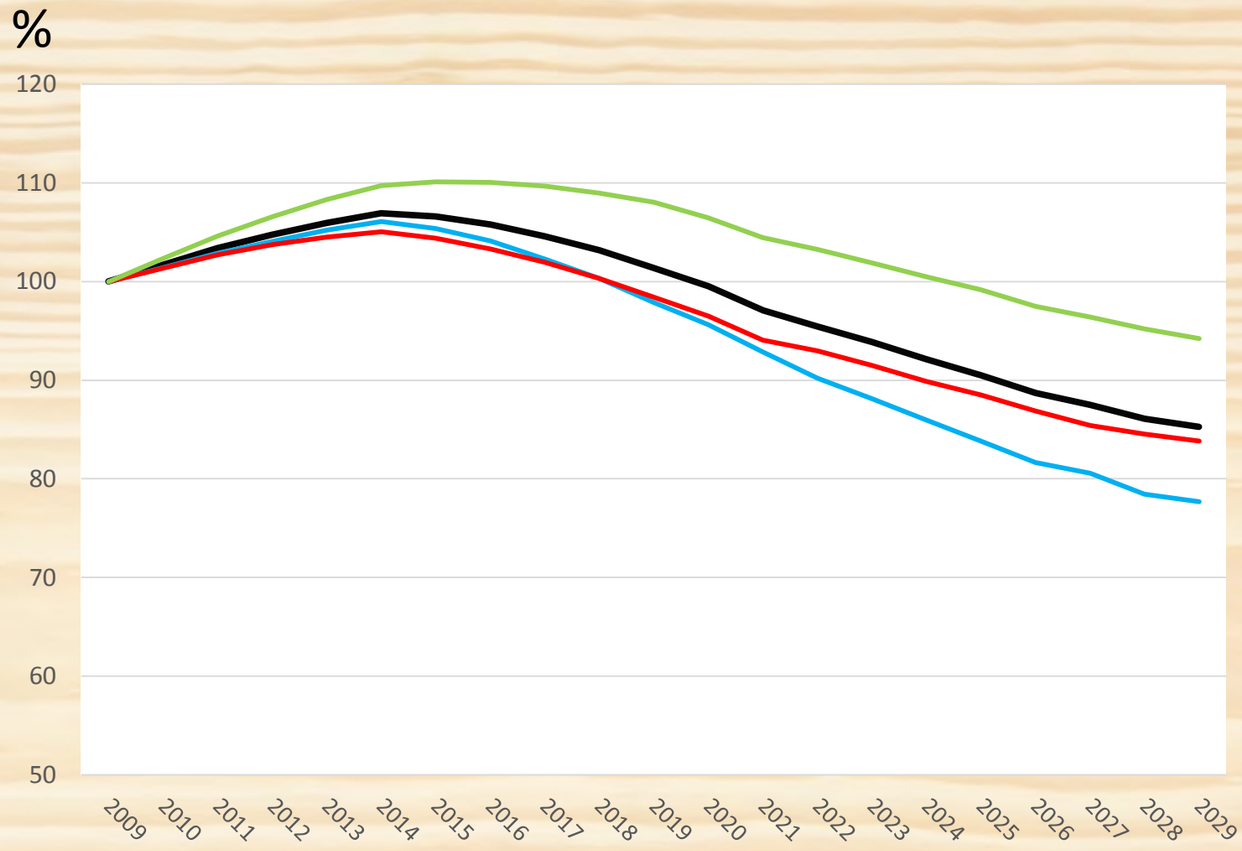


SRTS | Results

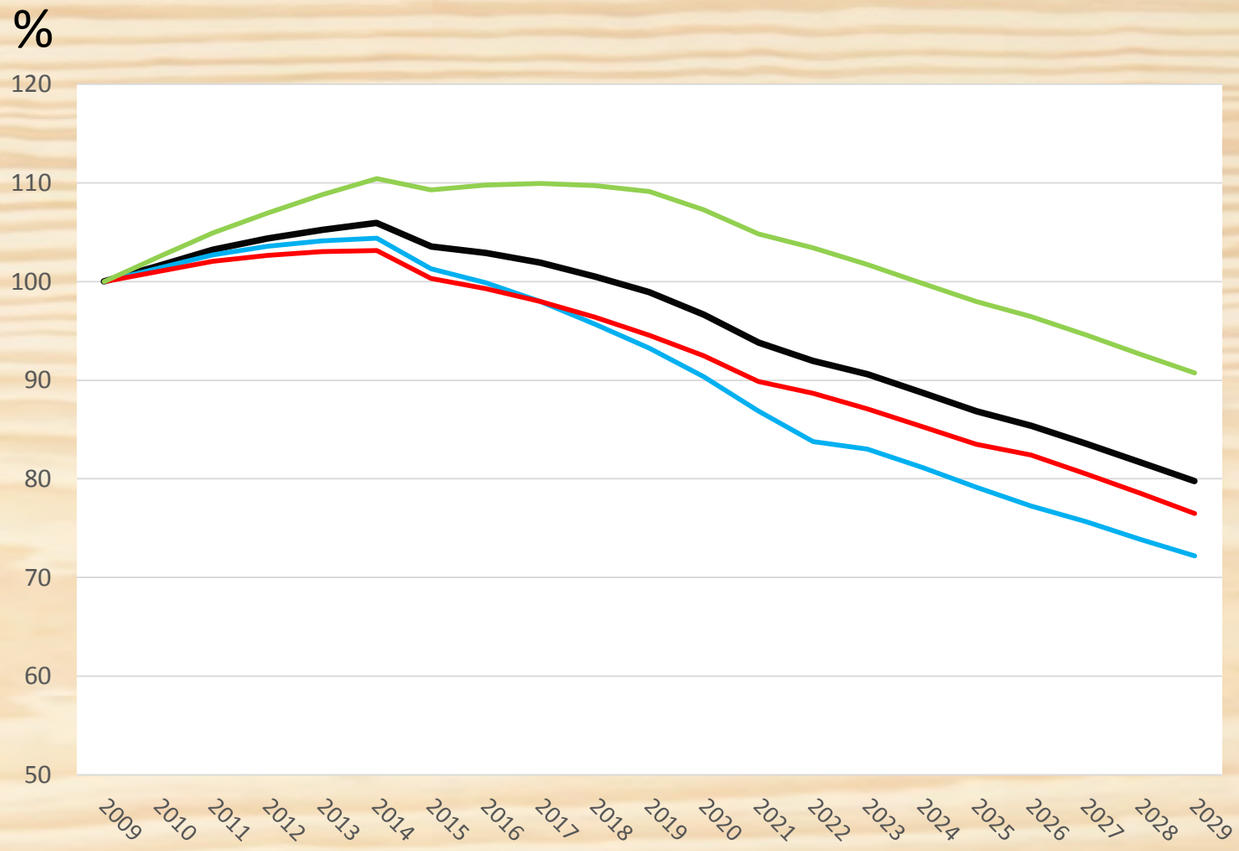
Pine Small Roundwood Low Demand Scenario

State S. Coastal Plain N. Coastal Plain Piedmont

Baseline



With Ice Storm Removals

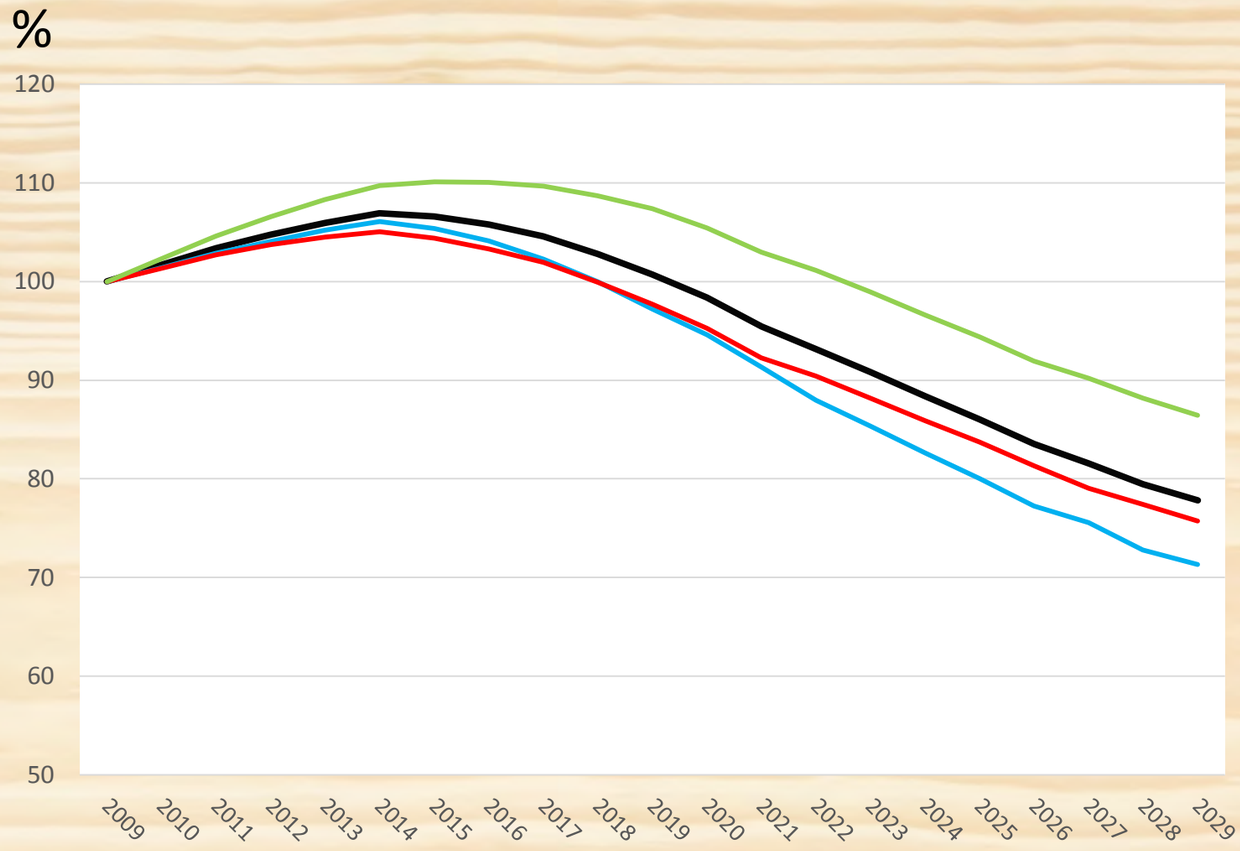


SRTS | Results

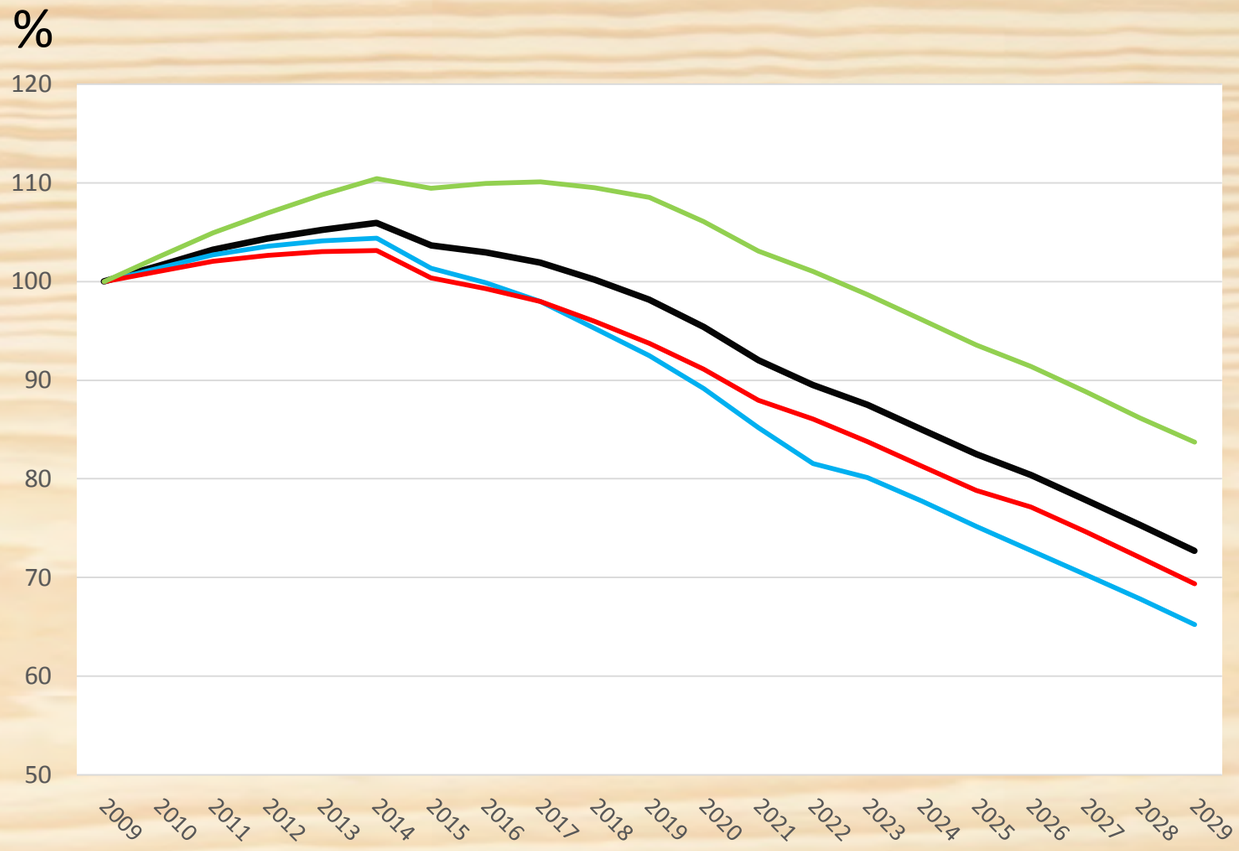
Pine Small Roundwood High Demand Scenario

State — S. Coastal Plain — N. Coastal Plain — Piedmont

Baseline



With Ice Storm Removals

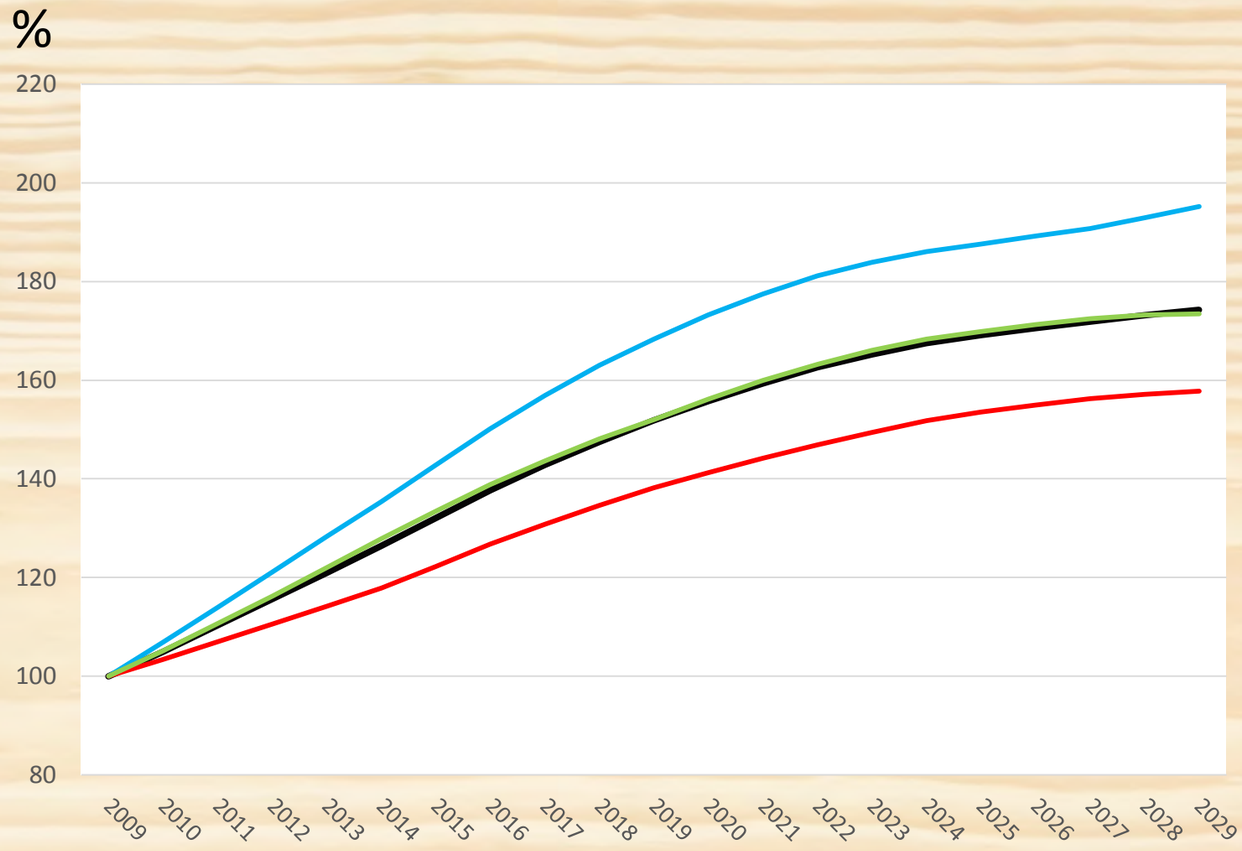


SRTS | Results

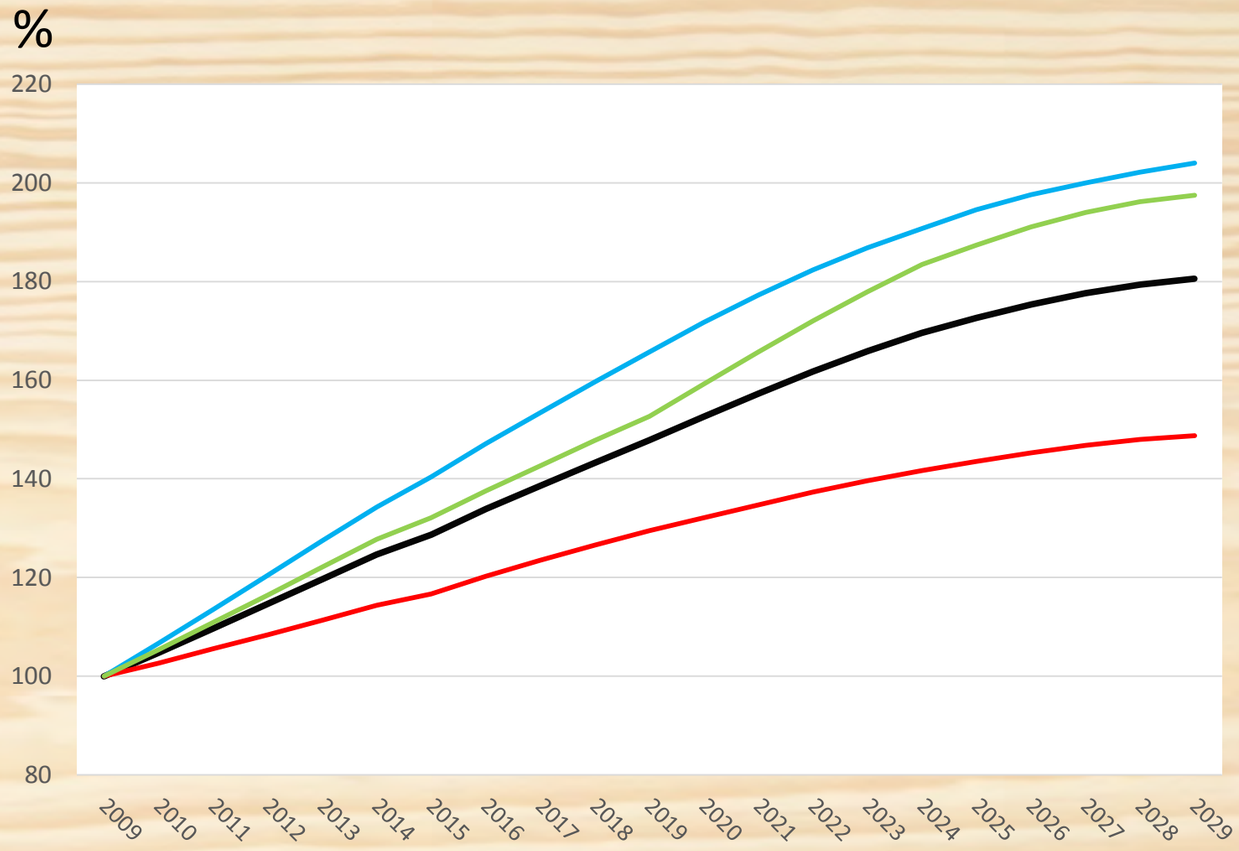
Pine Large Roundwood Low Demand Scenario

State S. Coastal Plain N. Coastal Plain Piedmont

Baseline



With Ice Storm Removals

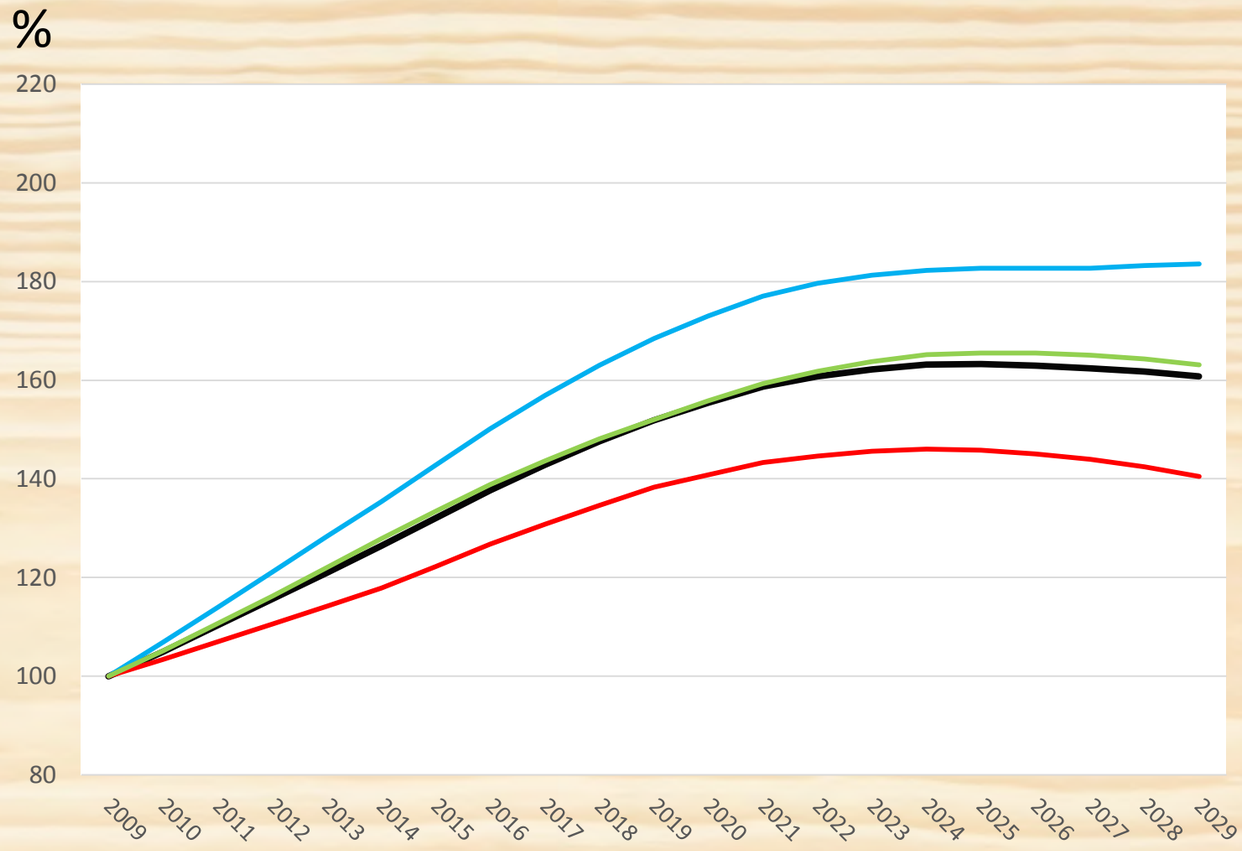


SRTS | Results

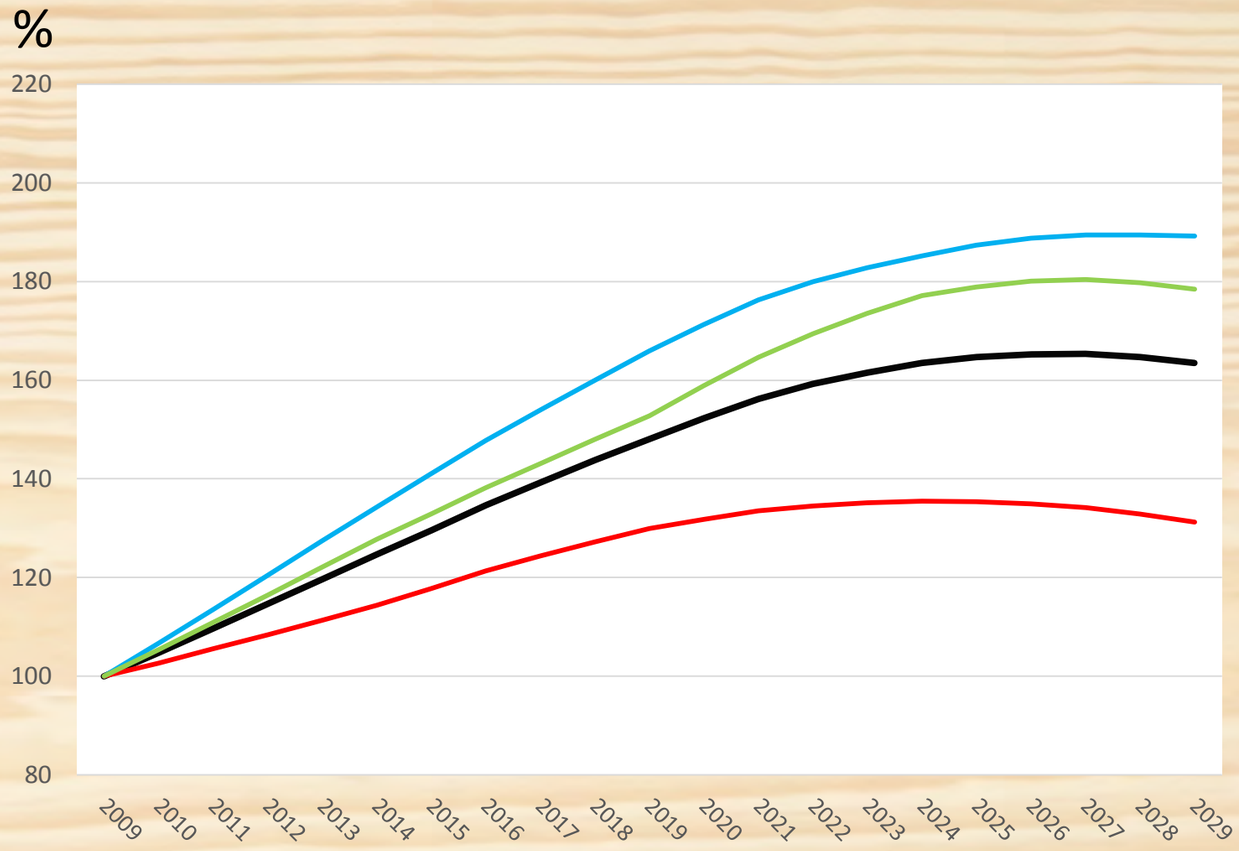
Pine Large Roundwood High Demand Scenario

State S. Coastal Plain N. Coastal Plain Piedmont

Baseline



With Ice Storm Removals

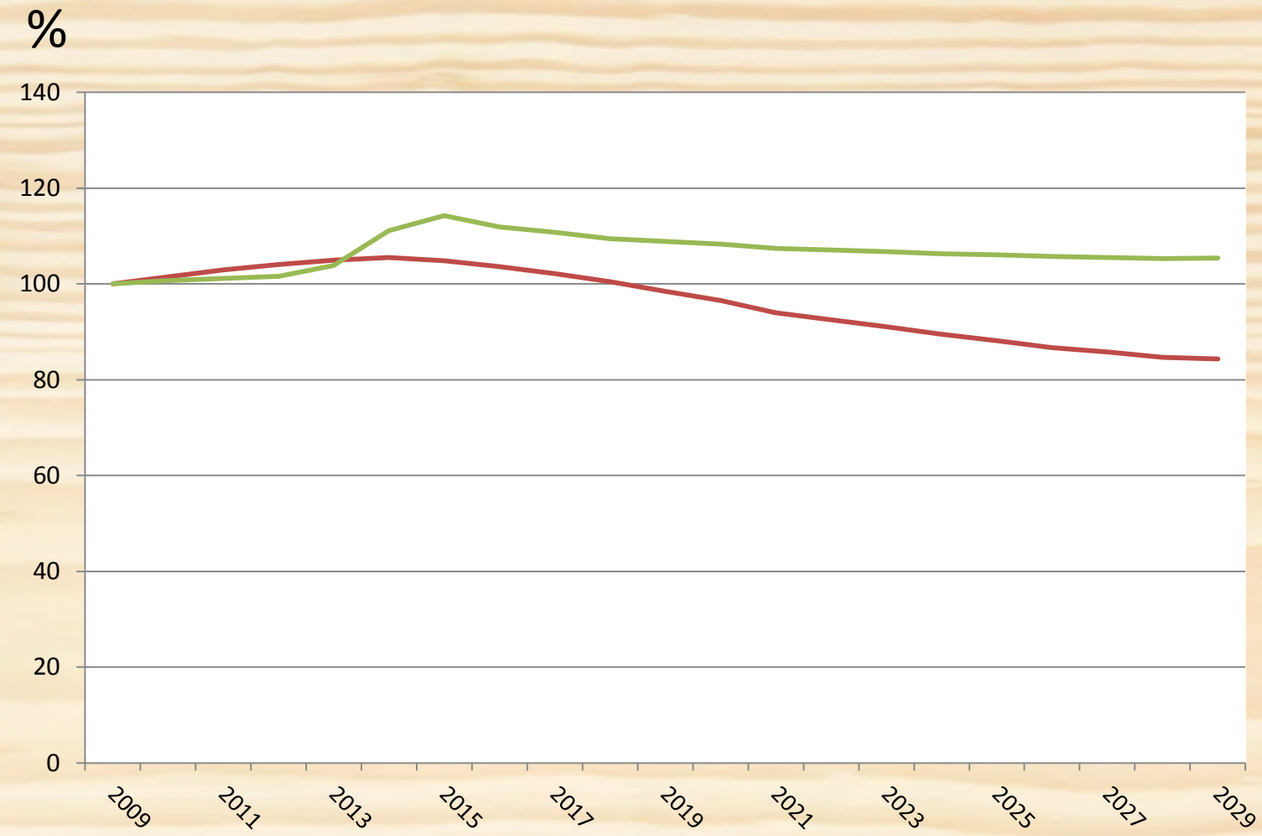


SRTS | Results

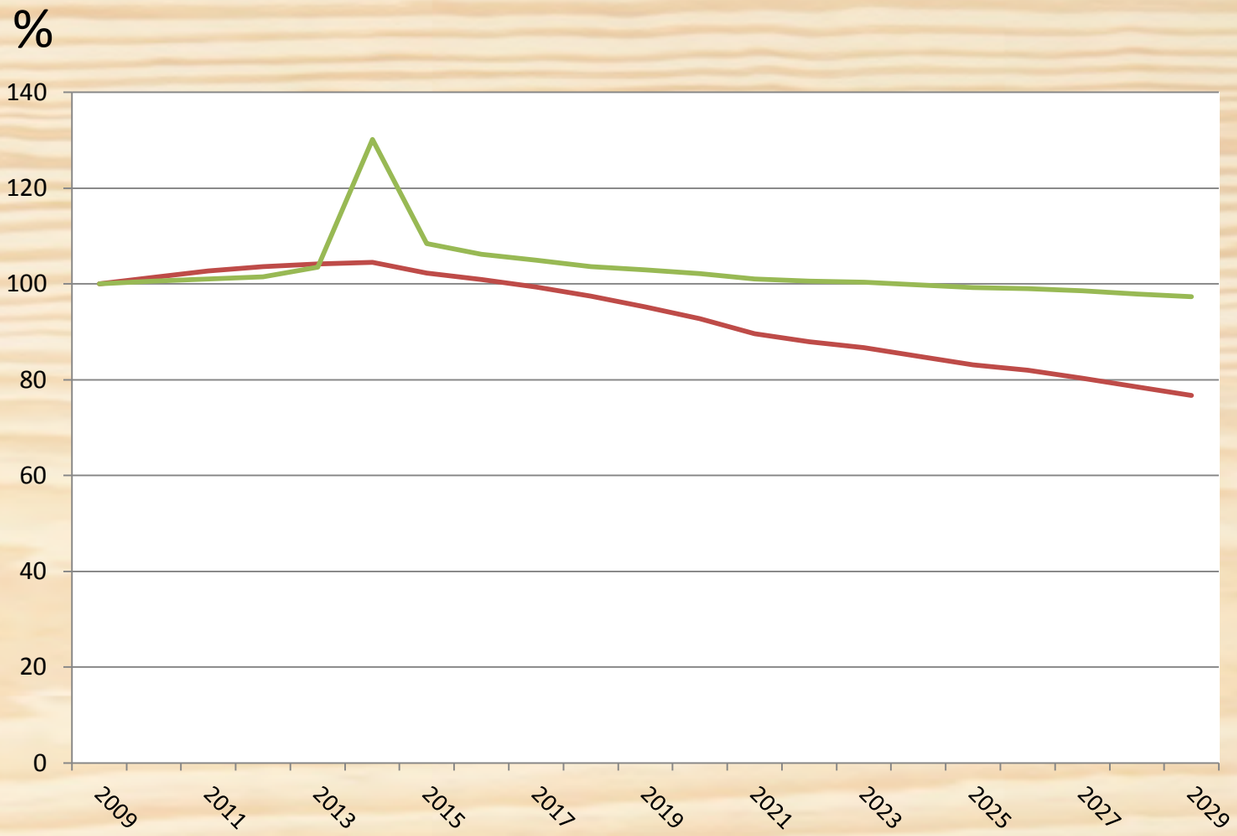
Pine Pulpwood Low Demand Scenario

Inventory Removals

Baseline

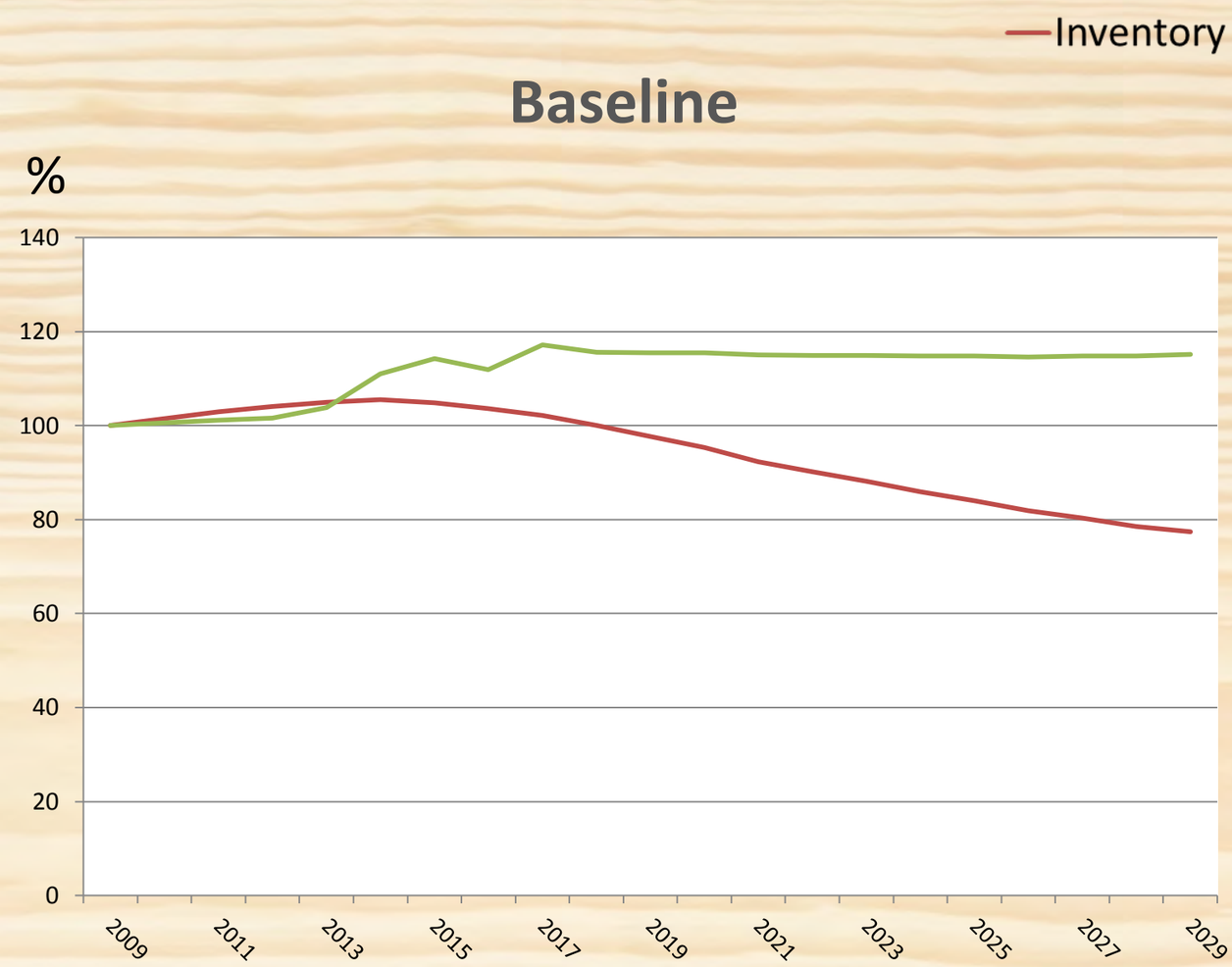


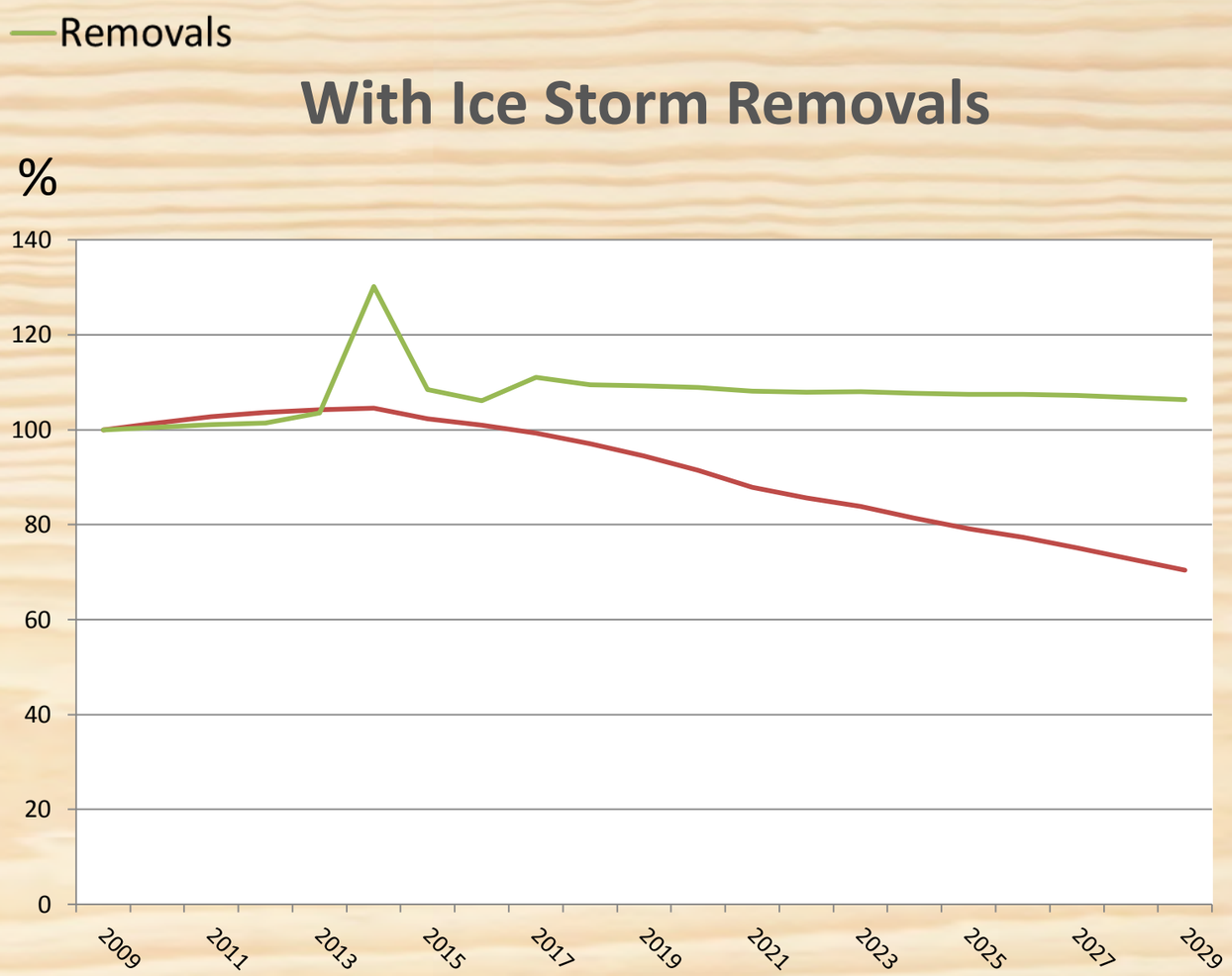
With Ice Storm Removals



SRTS | Results

Pine Pulpwood High Demand Scenario





SRTS | Key Points

- Short-term decrease in inventory for All Pine Products
  - Still above baseline
- Long-term reduction in All Pine Products inventory compared to 2012 Study, however still increasing overall
- Current demand levels will continue to reduce small-diameter Pine inventory
  - Under High Demand Scenario, reductions are more pronounced
  - Impacts vary widely by FIA Unit
- Large diameter Pine inventory increases subsequent to ice storm event
  - Driven by increasing demand?

Acknowledgements

Special thanks to Bob Abt, Jesse Henderson and the SOFAC group for their assistance, advice and feedback.

SOFAC
NC State University

Southern Forest Resource Assessment Consortium