

PRODUCTS and ECONOMICS of LONGLEAF MANAGEMENT

Ad Platt
V.P. for Operations, TLA

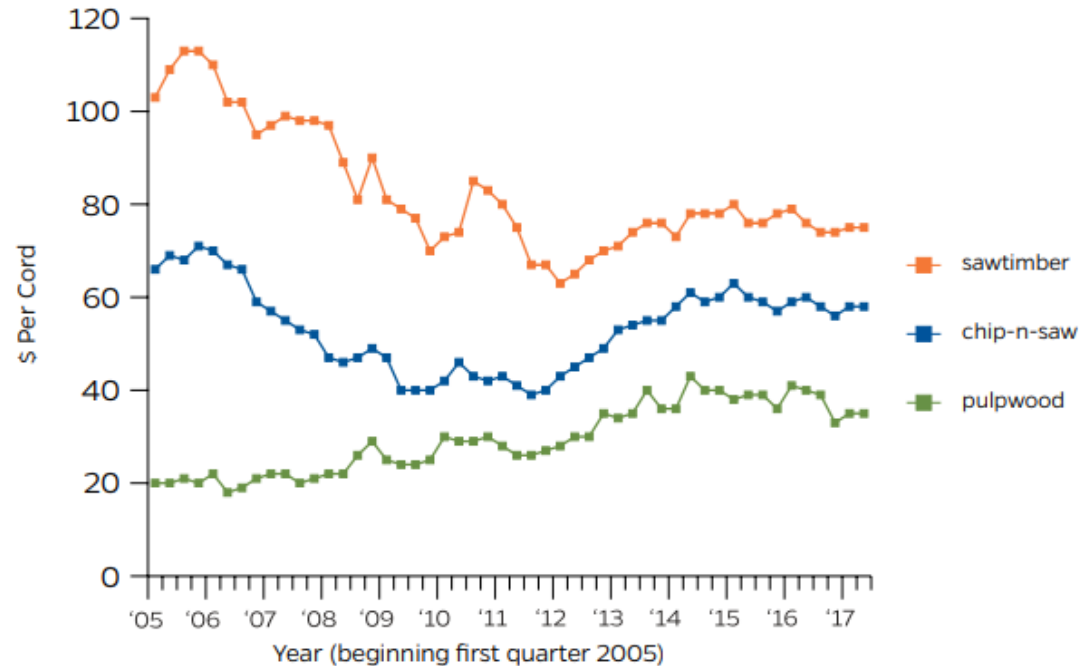
**What we know,
what we don't know,
and what we need to
know.**



Trend Report

Second quarter average stumpage prices for the three major timber products in Florida were the same as those in the first quarter of 2017. Despite the wet weather in Florida and across much of the region, stumpage prices did not improve and were down for most products in the Southeast. This was attributed to a continued oversupply at many mills from the wide access to wood during the dry months. Market drivers remain strong. Southern pine beetle activity has increased with several infestations reported in Florida this quarter. As always, monitor your pine stands and consult your forester if you suspect a forest health issue.






Average Pine Stumpage Prices for Florida
1st Qtr 2005 through 2nd Qtr 2017



Timber Mart-South is compiled and produced at the Center for Forest Business, Warnell School of Forest Resources, University of Georgia, under contract with the Frank W. Norris Foundation, a non-profit corporation serving the forest products industry. See <http://www.tmart-south.com/> for information on subscriptions.



S.C. Timber Mart South data and trends

Product Type	4Q/19 (\$/ton)	1Q/20 (\$/ton)	2Q/20 (\$/ton)	3Q/20 (\$/ton)	4Q/20 (\$/ton)	1-Yr Change	
Pine Pulpwood State Average	9.36	9.38	9.08	8.85	9.47	+\$0.11	
Pine Chip-N-Saw State Average	16.86	16.80	16.96	16.31	16.76	-\$0.10	
Pine Sawtimber State Average	23.56	23.43	22.49	21.61	22.03	-\$1.53	
Hardwood Pulpwood State Average	8.80	8.70	8.45	7.74	8.73	-\$0.07	
Hardwood Sawtimber State Average	24.86	27.38	24.46	19.89	22.84	-\$2.02	



Chip n Saw lumber is a commodity business. Just needs to be OK



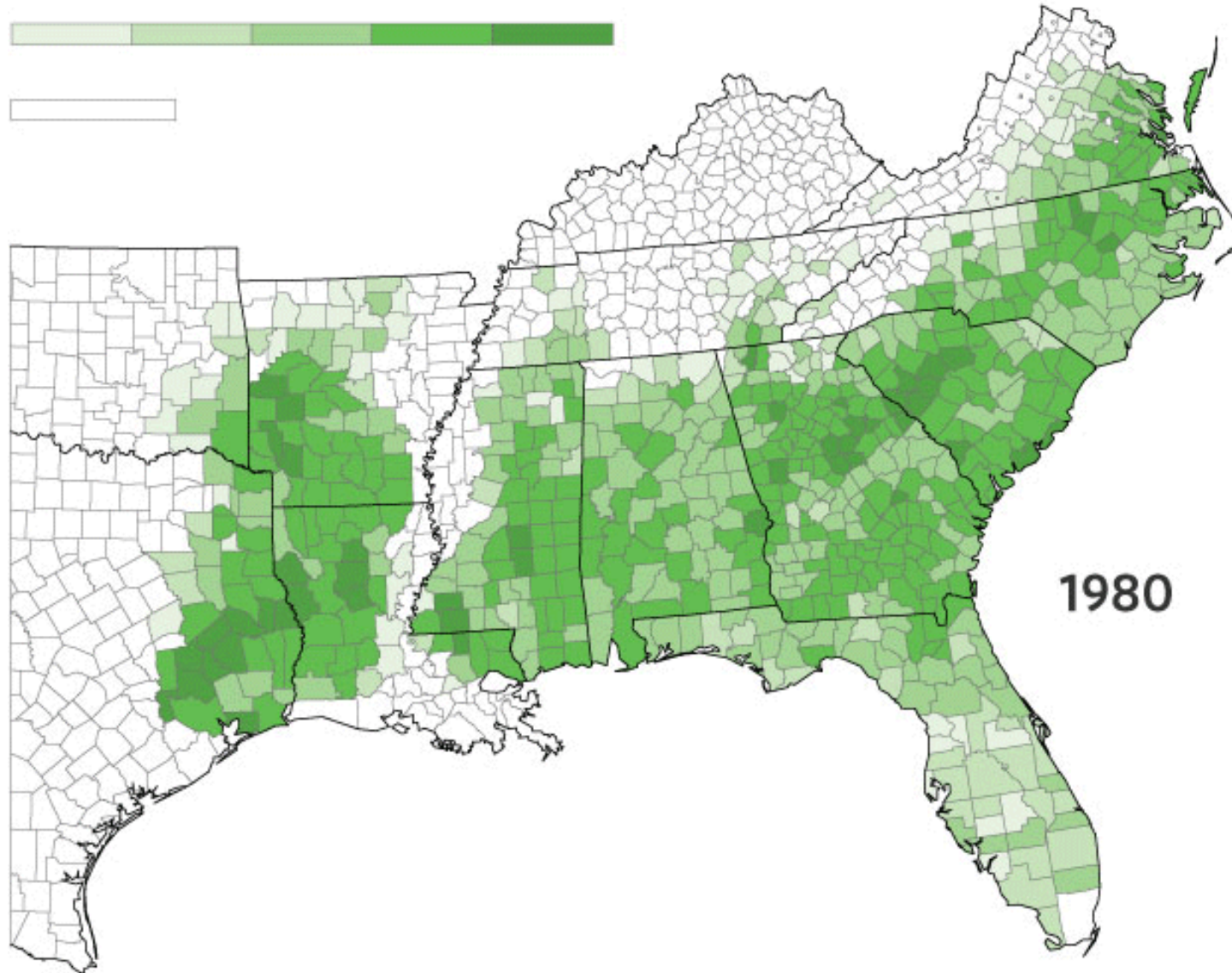
Credit: Karen Segrave - WSJ



*The Longleaf Alliance
Longleaf 101 Academy*

Products and Economics of Longleaf Management

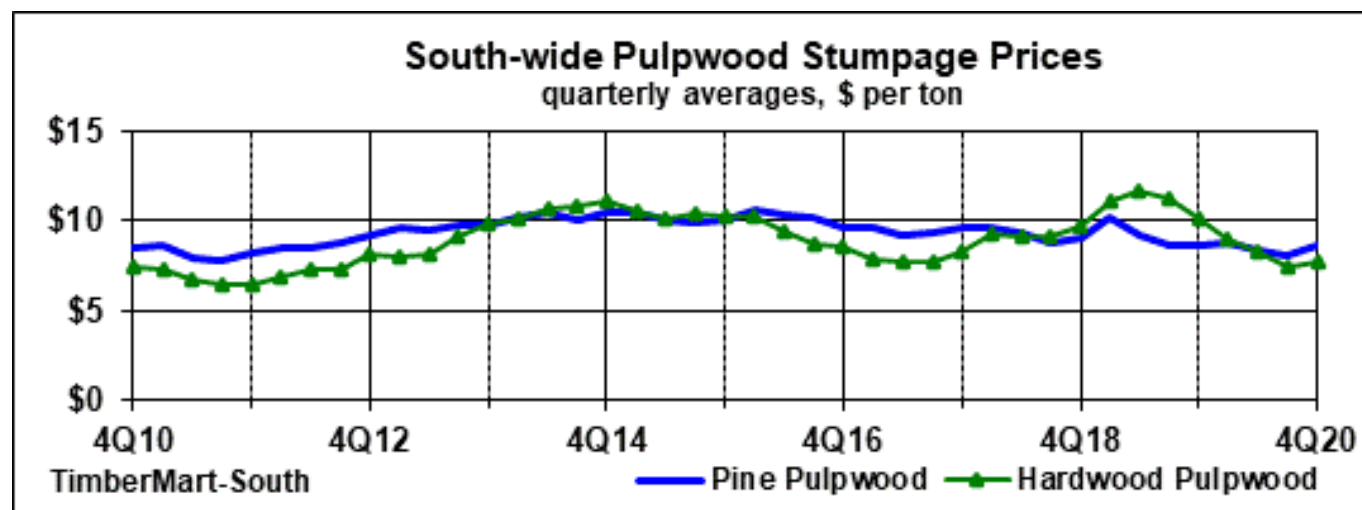
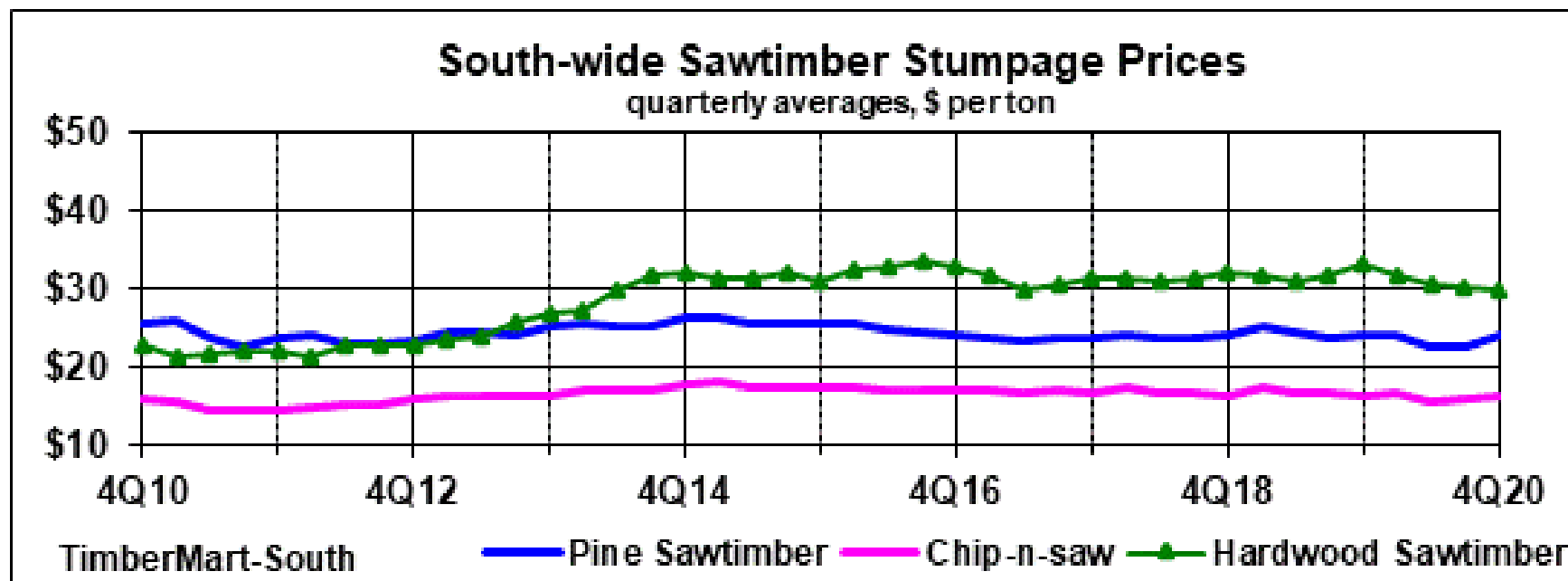
Thousands of small landowners, not enough mills → depressed prices



In some Counties, four times more wood than 1980
(source: WSJ)



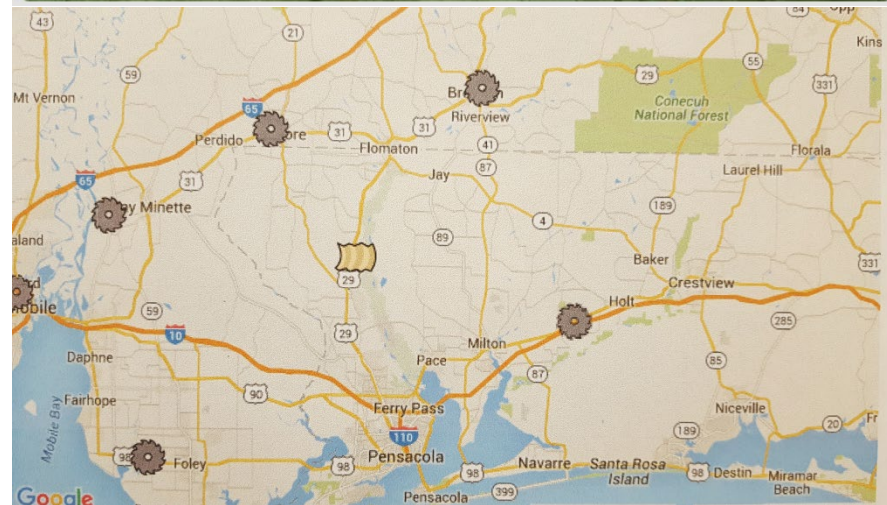
Prices still slumping downwards



You need to know what and where YOUR MARKETs are


Many Resources Available

- Ileconomics.sref.info
- www.freshfromflorida.com
- www.forestry.alabama.gov
- www.treefarmssystem.org/
- www.forestfoundation.org/
- www.forestproductslocator.org
- Local foresters and consultants



Welcome to the Primary Forest Products Network

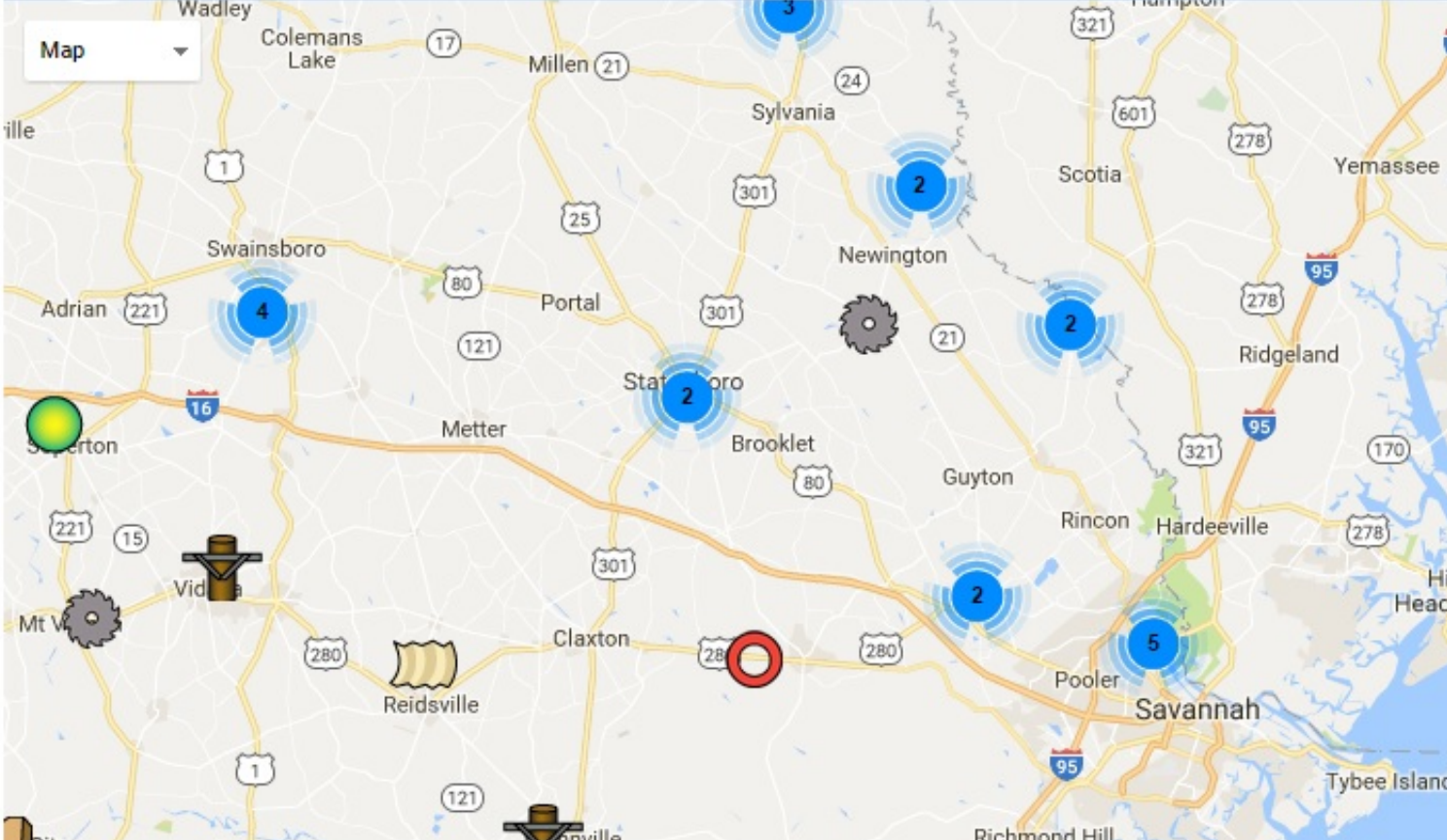
The mill map allows you to visually locate and drill down to find the mill you're interested in.

▼ Search Mills: export:  full screen

Search by mill name

Filter by location Filter by type

Map



The map displays the state of Georgia with various counties and major roads. Several mill locations are marked with blue circles containing numbers: 3 near Sylvania, 2 near Newington, 4 near Swainsboro, 2 near Stateboro, 2 near Guyton, 2 near Pooler, and 5 near Savannah. Sawmill icons are placed at locations like Mt Vernon and Vidalia. A red circle highlights a location near Claxton. The map also shows major highways like I-95, I-16, and US-17.



Growth

On most sites, grows competitively with other southern pines and better on dry sites

These longleaf are 5 years old and 18 feet tall on a good site in Lee County, AL



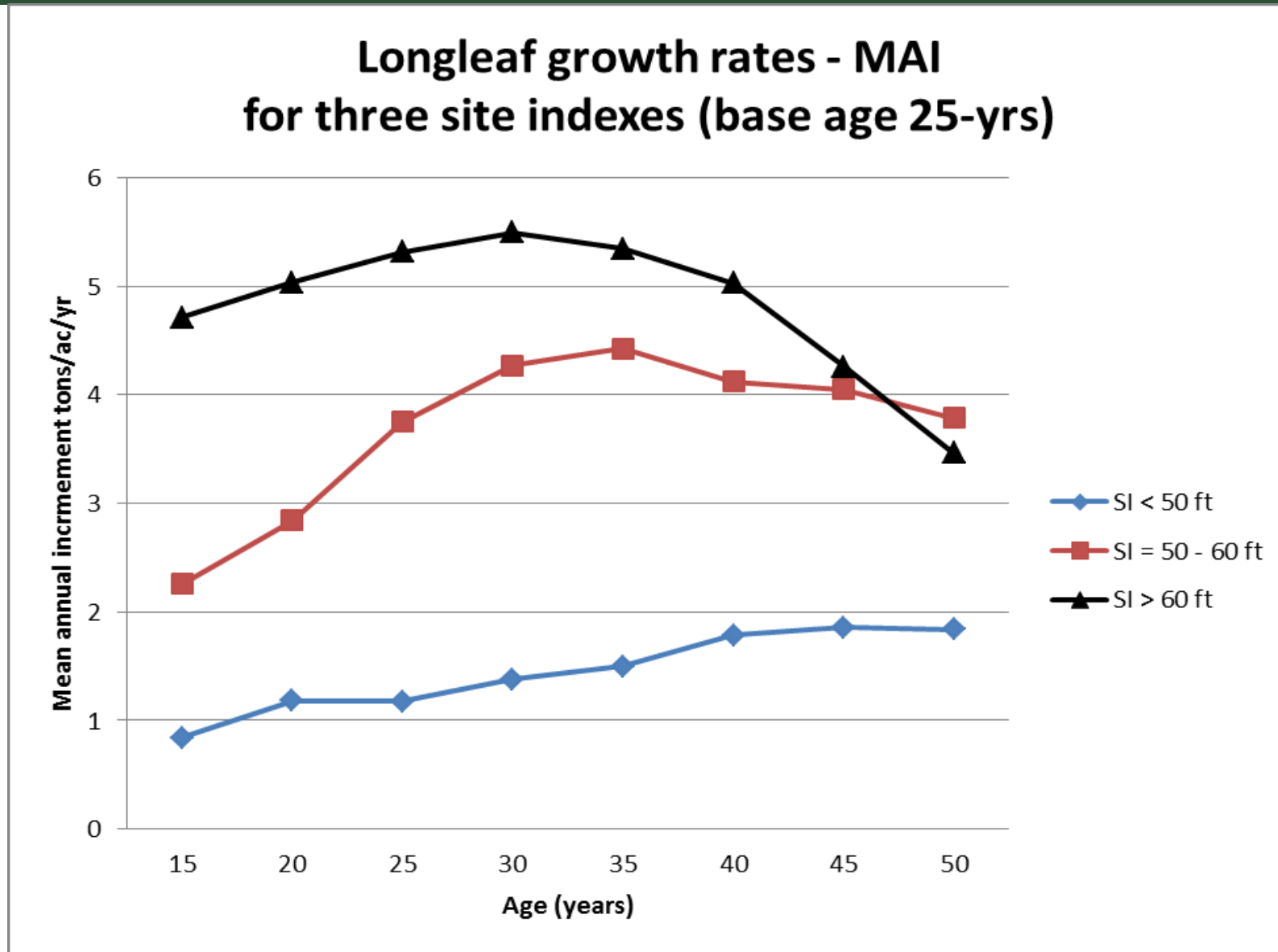
Slow grower? Longleaf at age 2 and 3 years



**This plantation was
a peanut field 14
years ago...thinned
at age 13 and
planted in native
understory
vegetation.**



Mean annual increment – base 25 on different sites



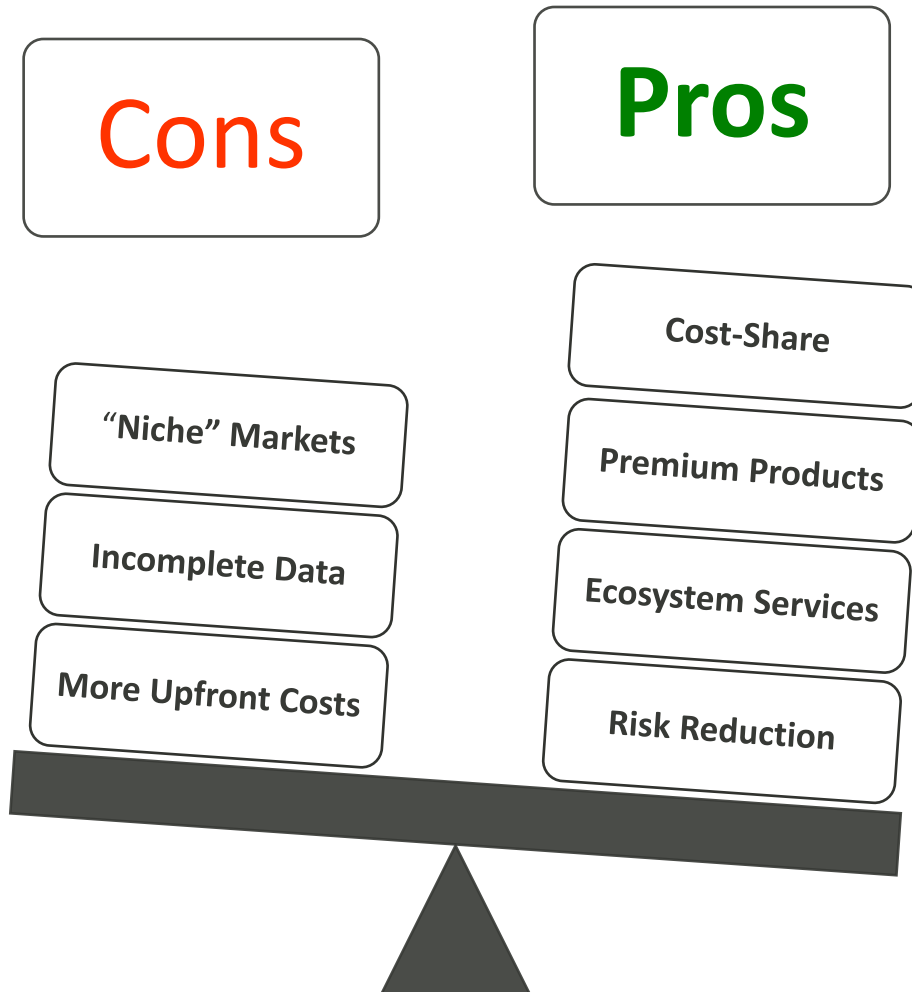
Where is YOUR finish line?



Marathon or sprint race?



Weighing YOUR Options



Longleaf "\$ value" Products

- Poles
- Sawtimber
- Chip-n-saw
- Pulpwood
- Pine straw
- Hunt leases
- (deer, quail, turkey)



Conventional and Emerging Markets

Conventional Markets

- **Timber: Poles, Sawtimber, Chip n' Saw**
- **Pine Straw: Market Premium for Longleaf**
- **Hunting Leases: Premium for “attractive” or wildlife-rich**
- **Real Estate: Pretty land with big timber sells at premium**

Emerging Markets:

- **Carbon: Milliken the example at 2018 Conference**
- **Water Yield or Quality: Developing in GA, SC, FL with Conservation Easements**
- **Mitigation Banking: Milliken, Westervelt examples; with Conservation Easements**
- **Sustainable Restoration x Market Sourcing: Enviva Projects**
- **Engineered Wood – Glulam, CLT, Mass Timber construction of mid-story buildings**



No. 1 Premium longleaf destined for export



Longleaf Poles – the blue-chip timber product



Partnering to improve High Conservation Value Forests



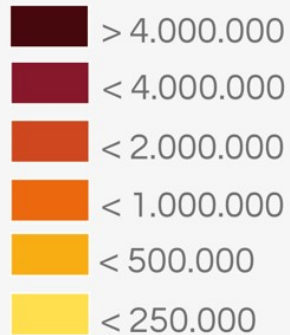
Wood pellets replacing coal for power generation, home heating

 **European/EU-28 wood pellet consumption**
(in 2016, tonnes, %)

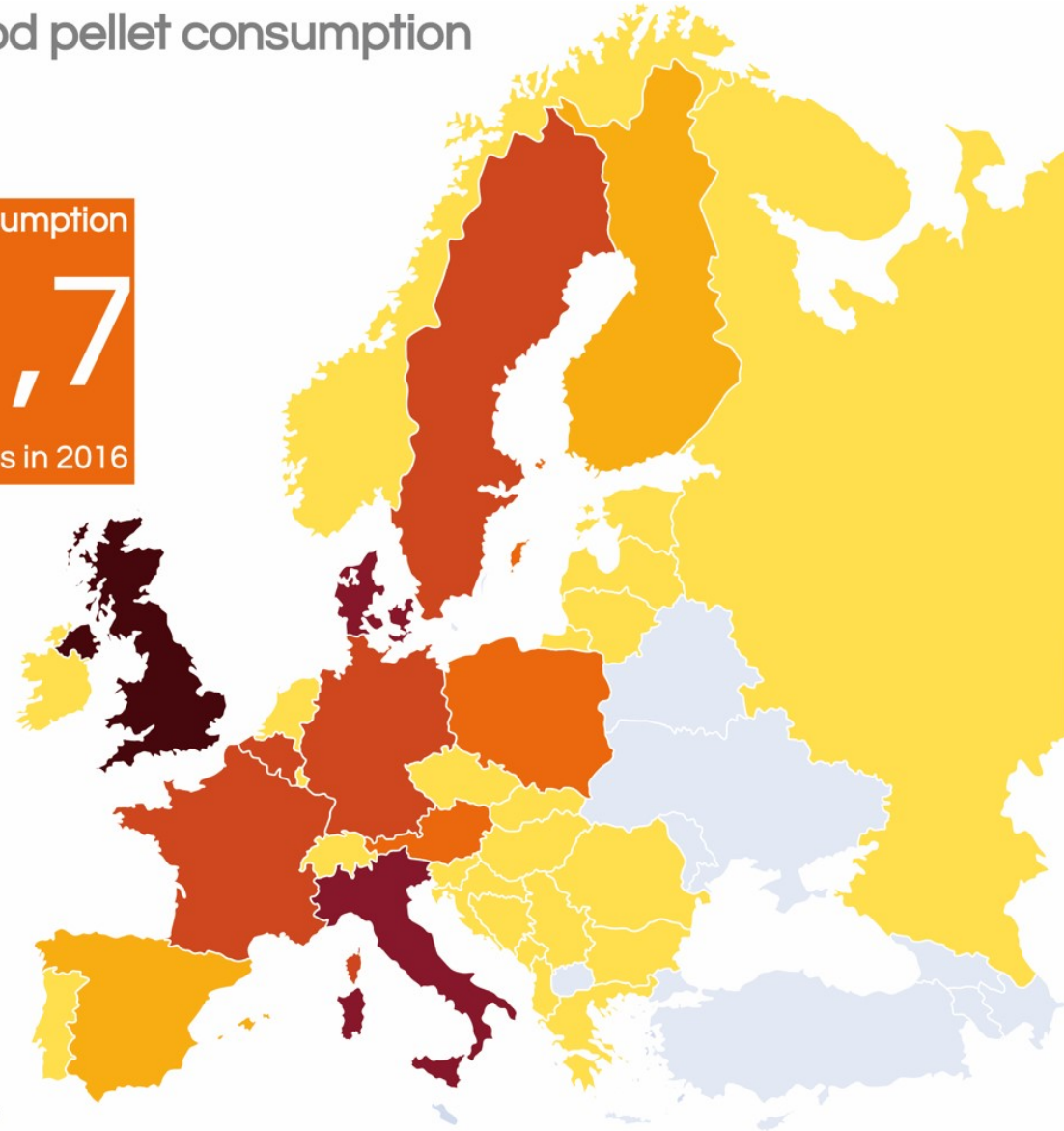
European consumption
22,3
million tonnes in 2016

EU-28 consumption
21,7
million tonnes in 2016

Actual consumption
(in tonnes)



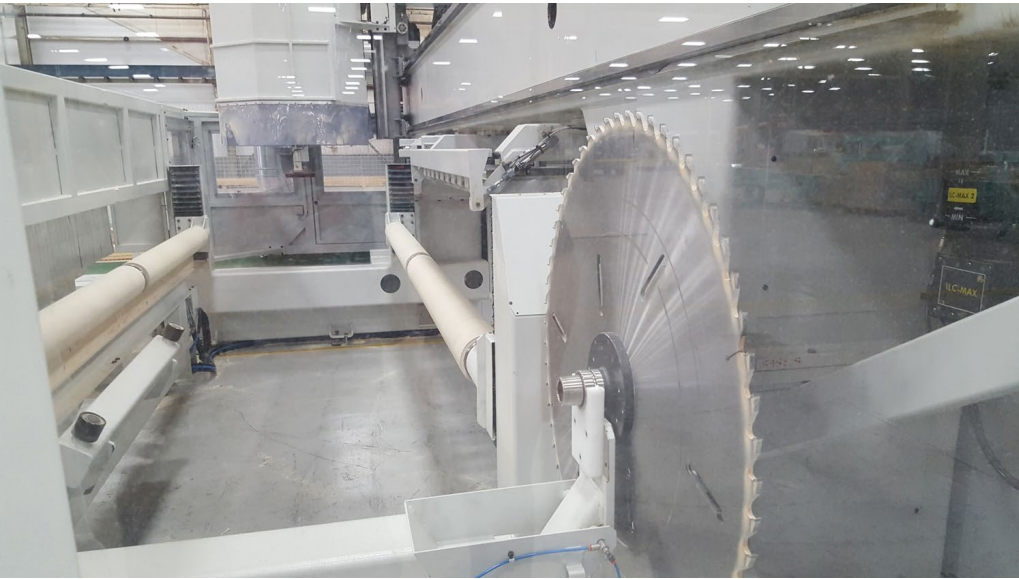
Source: EPC Survey



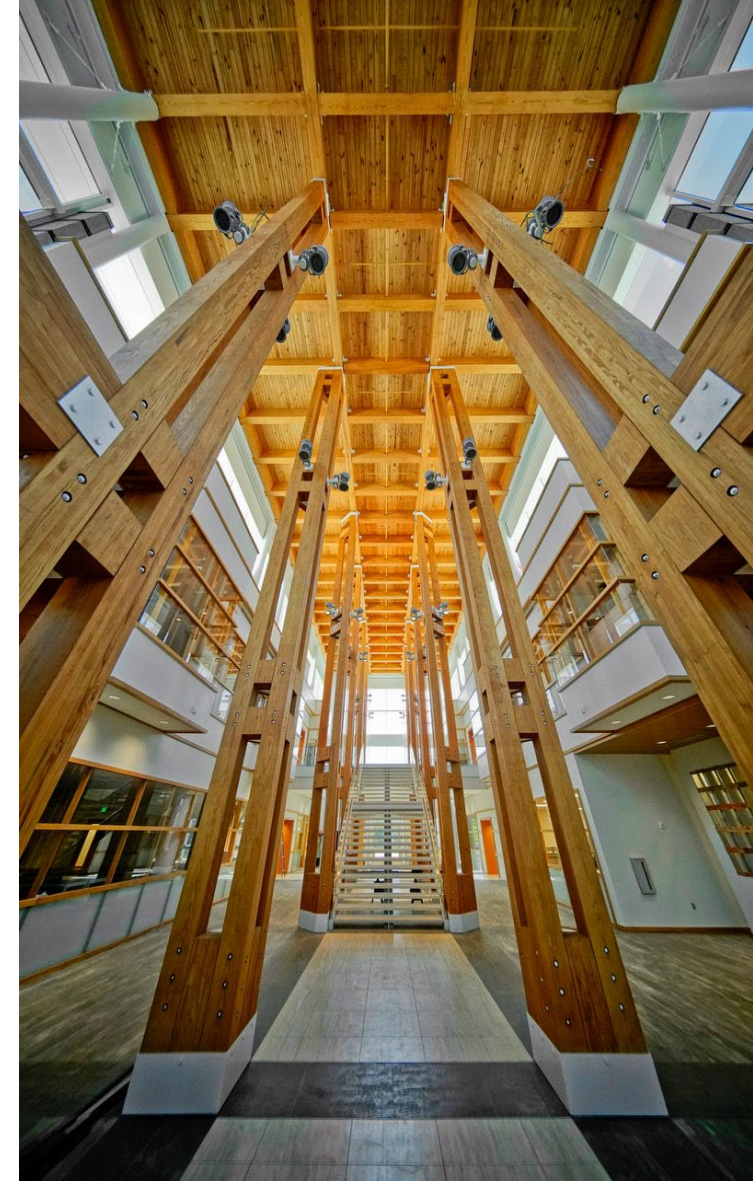
Engineered Wood – including GluLam



Computer Cut any design, any practical dimension



CNC – Computer Numerical Control



Rapid advances in wood design and innovation



Clemson's first Mass Timber & Steel construction - 2020



Southern Universities leading the way in Glulam applications of Southern Yellow Pine



The Longleaf Alliance
Longleaf 101 Academy

Products and Economics of Longleaf Management

Longleaf Advantages and Disadvantages

- Advantages - Low susceptibility to insect and disease, most fire and wind resistant, considered most favorable for most wildlife, pine straw value is highest, can grow poles with right management on some sites, cost-share programs give longleaf a large economic boost
- Disadvantages – least genetic improvement, relatively slow growth rate, stem quality on old-field sites can be poor with 50% “good” trees, survival problems on some old-field sites



Additional Factors

Longleaf inherently reduces risk of catastrophic loss to natural damaging agents

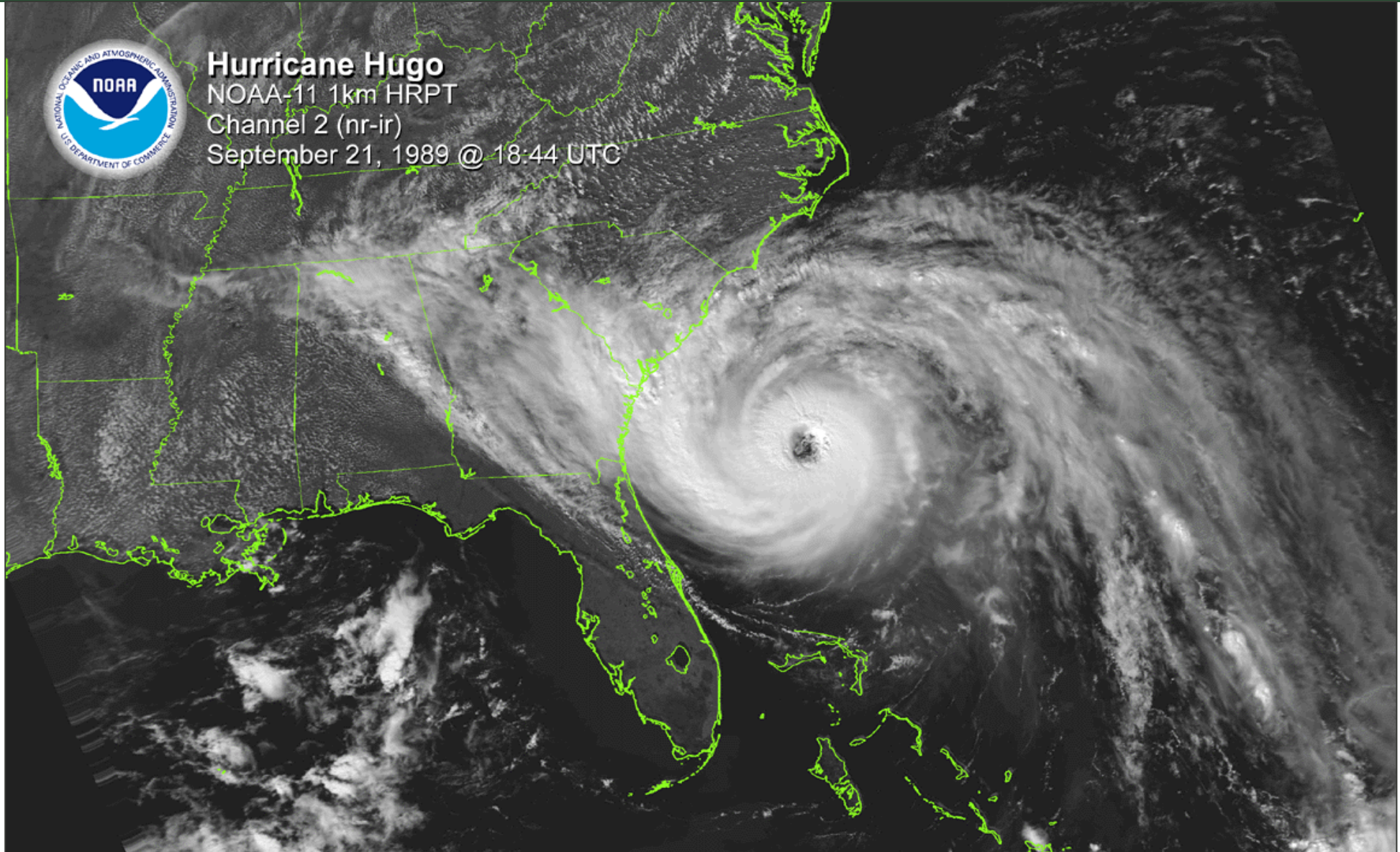
Hurricanes, pine beetles, fusiform rust, fire, and ice

Longleaf produces higher proportion of poles than other southern pines

One study showed loblolly, slash, and longleaf stands at age 39 yielding 7.91%, 11.4% and 71.65% poles, respectively



Hurricanes - and other wind events



Side by side plantations, all 39 years old, after Hurricane Katrina

Species	No Damage	Snapped	Leaning	Blown Over
Loblolly	16.3%	75.9%	5.7%	2.0%
Slash	52.4%	38.1%	7.8%	1.7%
Longleaf	64.0%	8.9%	16.9%	10.2%

Data collected and published by Glenn Hughes, Mississippi State University Extension



Risk reduced – especially from wildfire or arson

It is tolerant of fire throughout almost its entire life span, reducing risk of catastrophic loss to wildfire.



Provides protection against loss to insects and disease



Fusiform rust incidence is apparently increasing

More resistant to fusiform, longleaf may produce more usable wood than some other pines, even at a young age

Planted side by side, these 8 year old slash pines and the adjacent longleaf are virtually the same size. The slash has 60% fusiform infection, 35% stem canker occurrence. The longleaf had little rust.



Pine straw harvesting – a game changer for longleaf



Minimize labor and handling, improve profit!



Other values of beautiful and productive forests



Hunting Leases, particularly for quail hunting, can be very lucrative if the property is “quail friendly” and productive. Even more if proximal to urban markets.



Silvopasture



Ecosystem Values & Biodiversity



Real Estate Value



Carbon Credits



Conservation Easements (CE's)

Forest conservation easements protect land for existing and future forests by limiting certain activities. A forest conservation easement is a perpetual property right granted to another entity, often a land trust, that runs with the title of the land.

A landowner voluntarily agrees to sell or donate certain rights associated with his or her property – often the right to subdivide or develop – and a private organization or public agency agrees to hold and monitor the easement.



Carbon opportunities

Develop these in coordination with any Conservation Easement

- Finite Carbon
- AFF's Family Forest Carbon program
- Silvia Terra
- TNC's Working Woodlands program
- Green Assets
- CSP – Practice 612 Carbon Enhancement



Mitigation banking



Payments for Watershed Services (PWS)

Longleaf is efficient in use of water

- Low drought mortality
- Better adapted to drier conditions than slash or loblolly pine

Fire-maintained longleaf pine ecosystem uses:

- 15% less water than fire-excluded mixed pine-hardwoods
- 30% less water than intensive slash and loblolly plantations

Regional Success Stories

- Upper Neuse Clean Water Initiative
- Savannah River Clean Water Fund
- Northeast and Central Arkansas
- Central Texas



Incentive programs help many landowners get started

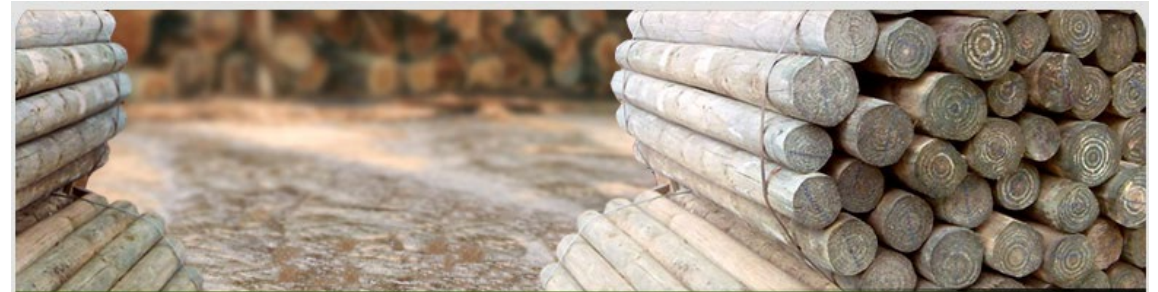
- **C**onservation **R**eserve **P**rogram
- **E**nvironmental **Q**uality **I**ncentives **P**rogram
- USF&WS Partners for Fish and Wildlife
- State Programs like **LIP**
- Southern Company/NFWF Longleaf Legacy

Many options for “cost-share”

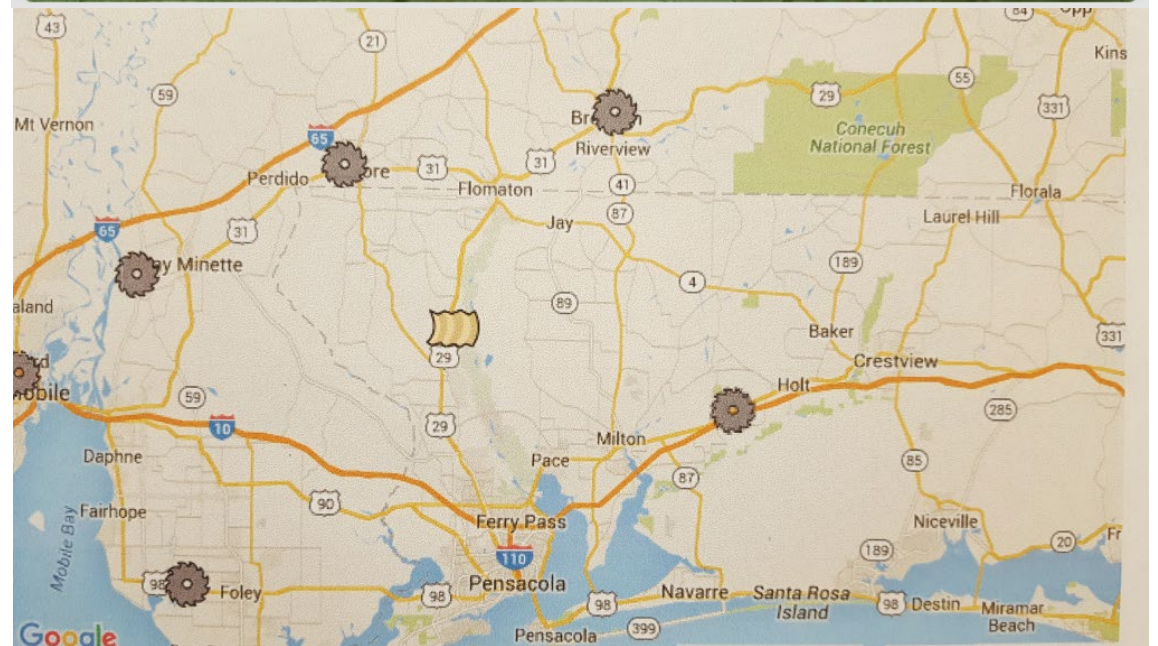


Many resources available online

- leconomics.sref.info
- www.srs.fs.usda.gov/econ/timberprices/answers/
- www.freshfromflorida.com
- www.forestry.alabama.gov
- www.treefarmssystem.org/
- www.forestfoundation.org/
- www.forestproductslocator.org
- Local foresters and consultants



Primary Forest Products Network



Basic Required Input for Economic Analysis

- **Upfront or establishment costs**
- **Anticipated revenues**
- **Interim costs during investment period**
- **Interim income during investment period**
- **Schedule of costs and income – when these occur in the rotation**
- **Alternative discount rate – what would you do if not this?**



Longleaf Investment Considerations

- **Costs – Fairly well understood**
 - Site prep, seedlings, release, Rx fire, Fertilizer
- **Revenues – harder to project**
 - Volatile timber markets, pine straw, cost-share, ecosystem services
 - Need modern plantation growth and yield model
- **Alternatives**
 - – Discount rate varies with the general economy and individual expectations– Treasury Bonds?



Investment Strategies

- In general, the best investments have low upfront costs, early returns or short investment horizons.
- Typically, forestry investments are just the opposite!
 - Most costs are upfront
 - Most returns are relatively late
 - Most investments are long term



Growth and yield projections for planted longleaf still in development

- **No long term or range-wide data sets for plantations, yet**
 - Range of sites, treatments, seedlings, spacing just now being measured!
- **No up-to-date model for natural stands**
 - One long term range-wide model but hasn't been updated in 20 years
 - Now seems to be growing faster, either due to climate or CO2 changes
 - Continued re-measurement indicates significant growth increases, but no model development to incorporate new measurements into model



Calculating the Net Present Value (NPV) and Internal Rate of Return (IRR)

- **Based on moderate assumptions for growth, product yields, and markets**
- **Assume starting with plantation establishment and ending with harvest leaving shelterwood stocking at age 45 of ~ 30 sq.ft BA**
- **Assumes moderate estimates for establishment and other management costs**



Basic **COST** assumptions

- Establishment cost @ \$235/Acre
- Release treatment at age 1 @\$ 35/a
- Burn costs every 3 years @ \$15/Acre
- Fertilize for Straw every 5 years beginning at age 10 @ \$50/A



Basic **INCOME** Assumptions

- First thin @ age 19 yields \$180/a
- 2nd and 3rd @ thins at ages 29 and 39 yield \$450/a and \$750/a respectively
- 4th harvest at age 45 yields \$1,500/a and leaves a shelterwood.
- Straw yields at beginning at age 6 @ \$50/a and raking two consecutive years with “rest” year
- Straw yields at age 10 jump to \$75/a per year
- Straw yields at age 15 jump to \$100/a
- Straw yields go to \$125/a at age 30 and remain there



Cost-share Assumptions

- Establishment cost-share rate @ 50%
- CRP contracts for 15 years
- CRP annual payment @ \$45/A year for 15 years
- CRP + pine straw after 15 year contract expires



Analysis

No.	Scenario	NPV@4.5%	NPV@6%	IRR
1	No cost share or straw	\$197.35	\$-2.60	6%
2	No C/S with straw	\$893.65	\$481.81	11%
3	50% c/s w/o straw	\$282.15	\$81.41	7%
4	CRP w/o straw	\$787.15	\$544.68	29%
5	CRP w/ straw	\$1317.28	\$882.50	30%



Take Home Lessons

- **Still a positive return on investment without cost share assistance or pine straw with reasonable expectations**
- **Early return on investment, especially with cost share, annual rental, or periodic pine straw income make a huge difference in profitability**



Bare land value @ 4% and 6% for loblolly, longleaf and slash pine w/out pine straw – NO COST SHARE

Pine species & rotation age	4% no pine straw	6% no pine straw
Loblolly (24-yrs)	\$954/ac	\$358/ac
Slash (33-yrs)	\$767/ac	\$219/ac
Longleaf (45-yrs)	\$275/ac	-\$128/ac (5.1% IRR)

Dr. David Dickens, UGA, 2017



Bare land value @ 4% and 6% for loblolly, longleaf and slash pine w/out pine straw – but with longleaf 50% EQIP site prep + plant COST SHARE

Pine species & rotation age	4% no pine straw	6% no pine straw
Loblolly (24-yrs)	\$954/ac	\$358/ac (9.1% IRR)
Slash (33-yrs)	\$767/ac	\$219/ac (7.8% IRR)
Longleaf (45-yrs)	\$482/ac	\$56/ac (6.5% IRR)



Bare land value @ 4% and 6% for loblolly, longleaf and slash pine w/ pine straw – NO COST SHARE

Pine species & rotation age	4% w/ pine straw	6% w/ pine straw
Loblolly (24-yrs)	\$1373/ac	\$632/ac
Slash (33-yrs)	\$1295/ac	\$581/ac
Longleaf (45-yrs)	\$1191/ac	\$507/ac



Bare land value @ 4% and 6% for loblolly, longleaf and slash pine w/ pine straw – & longleaf w/ 50% EQIP site prep+seedlings+plant COST SHARE (pine straw @ \$175/ac 12-20 yrs)

Pine species & rotation age	4% w/ pine straw	6% w/ pine straw
Loblolly (24-yrs)	\$1373/ac	\$632/ac
Slash (33-yrs)	\$1295/ac	\$581/ac
Longleaf (45-yrs)	\$1502/ac	\$732/ac



Longleaf pine with the Conservation Reserve Program (CRP) CP36 cost-share → assumptions

- \$100/ac sign bonus + 90% of site prep+seedlings + planting costs covered = net \$75/ac cost at time zero
- \$50/ac/yr CRP payment for 15 yrs (\$750/ac from pmts)
- Pine straw raked from age 15- through age 20-yrs @ \$150/ac/yr (\$900/ac from pine straw)



Bare land value @ 4% and 6% for loblolly, longleaf and slash pine w/ pine straw – and w/o & w/ LONGLEAF COST SHARE + pmts

Pine species & rotation age	4% w/ pine straw	6% w/ pine straw
Loblolly (24-yrs)	\$1373/ac	\$723/ac
Slash (33-yrs)	\$1295/ac	\$581/ac
Longleaf (45-yrs) no cost share	\$1191/ac	\$507/ac
Longleaf (45-yrs) w/ pine straw & cost share	\$1766/ac	\$966/ac



The economic comparison of loblolly wood only (no straw) vs slash with pine straw vs longleaf with cost-share+pmts + straw & no pine straw

Pine species & rotation age		4%		6%
Loblolly (24-yrs) – no pine straw		\$954/ac		\$358/ac
Slash (33-yrs) – w/pine straw		\$1295/ac		\$581/ac
Longleaf (45-yrs) w/ pine straw & cost share and pmts		\$1766/ac		\$966/ac
Longleaf (45-yrs) no pine straw w/ cost share + pmts		\$1218/ac		\$644/ac



Economic comparison of loblolly wood only (no straw) slash with pine straw

longleaf with cost-share+pmts + straw

CRP + straw

& no pine straw Internal rate of return

Pine species & rotation age	Internal rate of return (%)
Loblolly (24-yrs) – no pine straw income	9.1
Slash (33-yrs) with pine straw income (\$75/ac age 8-15 yrs)	11.4
Longleaf (45-yrs) 50% EQIP site prep+plant only + \$175/ac pine straw (age 12-20yrs)	13.3
Longleaf (45-yrs) w/ pine straw (\$100/ac 15-20 yrs) & cost share + 15 yr annual pmts (\$50/ac)	38.9
Longleaf (45-yrs) no pine straw w/ cost share + 15 yr annual pmts (\$50/ac)	37.4



If your primary objective is maximizing income

Economics – comparing longleaf vs loblolly vs slash summary

- Loblolly is most attractive financially on a shorter 24-yr, 1 thin rotation when the only source of income is wood
- Slash is most attractive financially on a 33-yr, 2 thin (also attractive on a 24-yr, 1 thin rotation) when wood+pine straw are possible
- Longleaf is most attractive financially when a signing bonus, site prep+seedlings+planting cost share and annual payments are available and pine straw is added



Why 45 year rotations? The premium value from growing more poles!

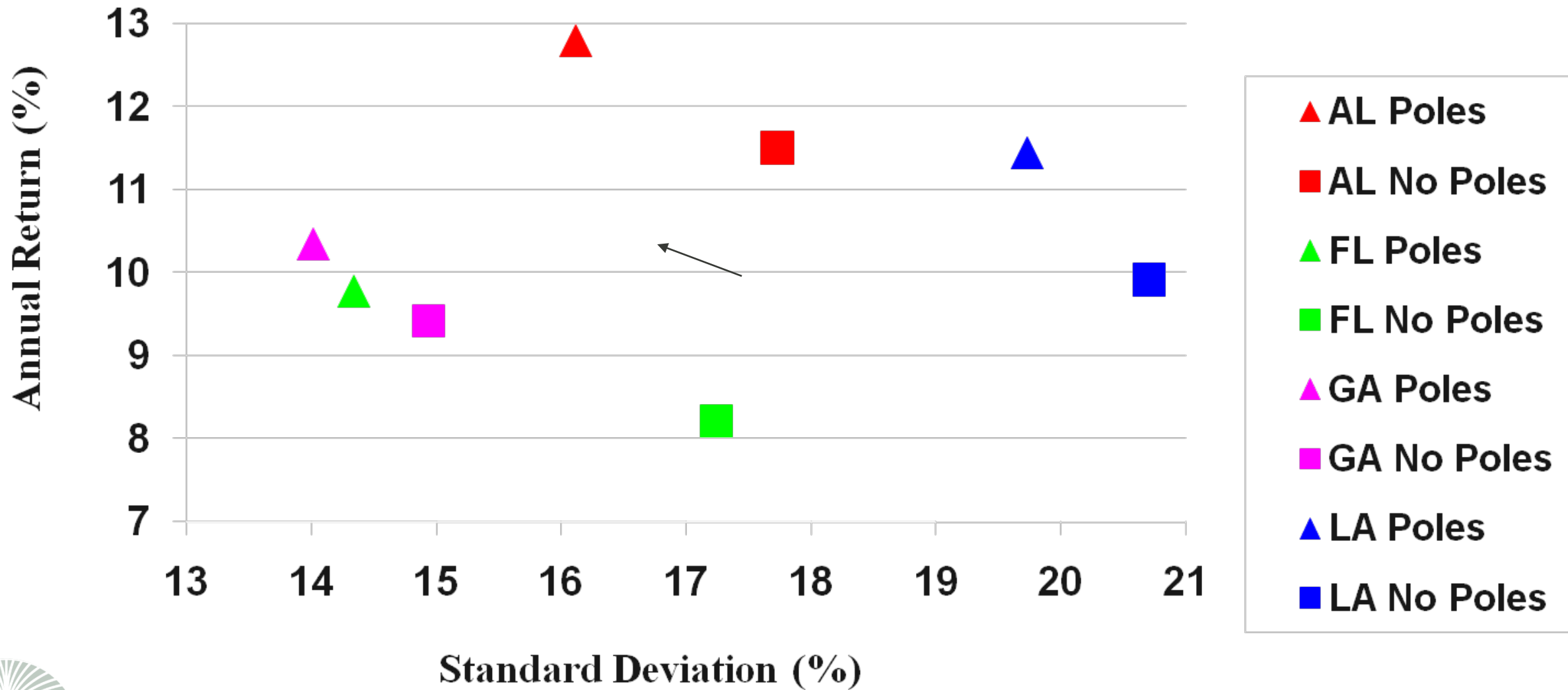


Longleaf's higher propensity for producing poles makes older longleaf like your blue chip stock; consistently higher prices, and generally stable, lowering your risk.

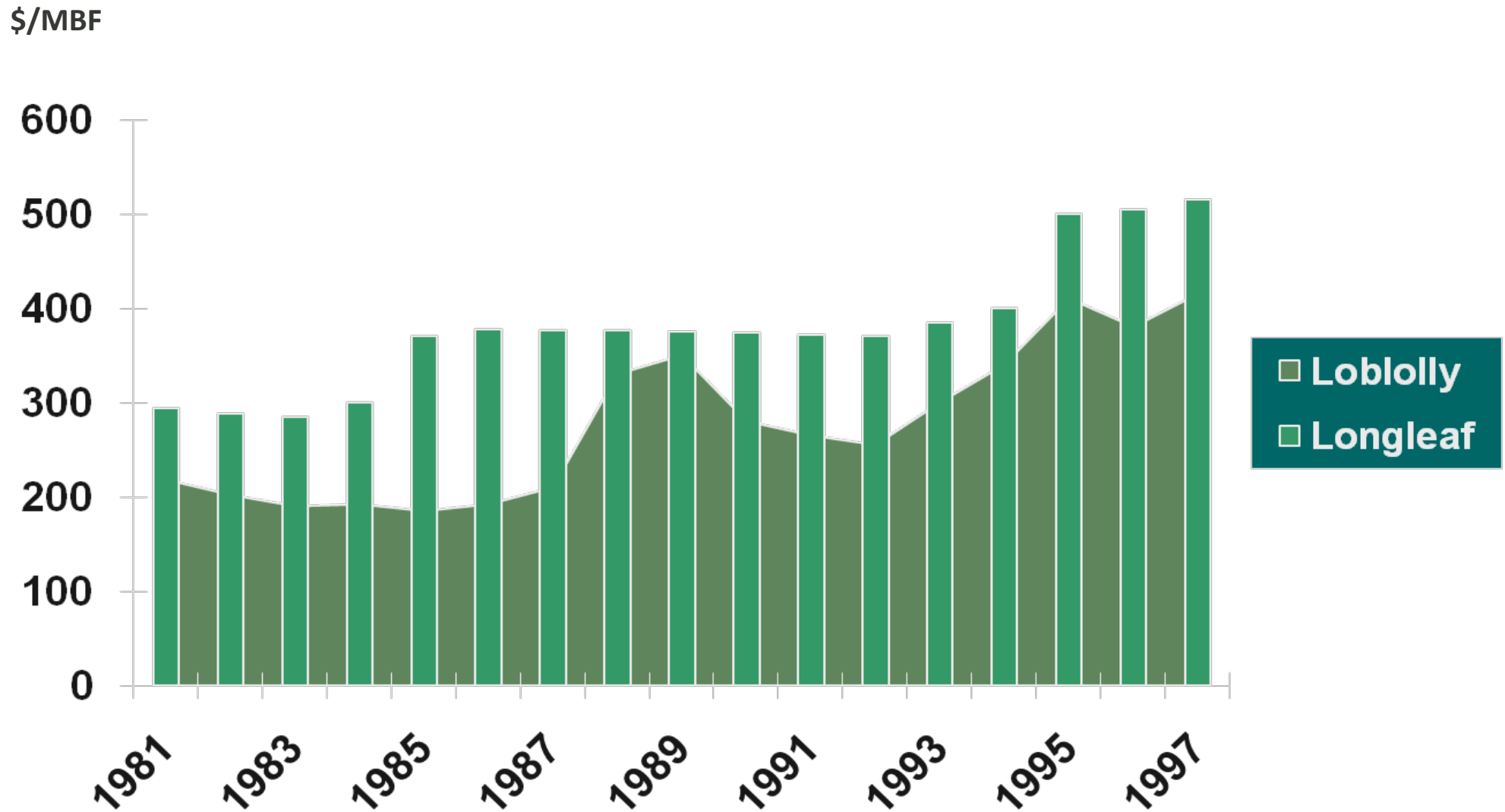
When pulpwood or sawtimber crashes, you are at the mercy of the market if that is all you have.



Poles Raise Returns And Reduce Volatility at the same time



Actual Timber Sale data from Hattiesburg, Mississippi area



Managing for Poles

- Higher planting density – you can always take trees away.
- Maintain higher basal area – no more than 5th row thinning, 80 basal area to achieve ANSI spec (6-12 rings/in - outer 2 inches)
- Know your local markets & dealers
- Burn regularly to provide better access.
- Keep costs low (35-45 year rotation)



If you have beauty and quality, you can sell in any market



Take Home Messages

- Longleaf is a good option for private landowners for economic as well as ecological reasons
- Natural stand management is a viable option for landowners who have longleaf already
- Expertise is available to optimize your objectives, both economic and ecological, thru management

