

# Forestry/Biomass Supply Chains

## U.S. Southeast

Presentation to the Biomass Research & Development  
Technical Advisory Committee

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# Pellet supply - why the US?

**U.S. has >750M acres of forest land**

**U.S. Forests surveyed and growing substantially**

**U.S. forests are the same size now as they were in 1930 and have been growing year on year since the 1950s - volumes have increased by over 50% in the last 50 years**

**Protected by statutes, regulation and BMP's**

**Designed to ensure forests continue to grow**

**Sustainable forest management**

**U.S. South**

**Climate supports short timber rotation 25-28 yrs pine**

**Very significant volumes available**

**Current harvest is 300Mt to 350Mt /yr**

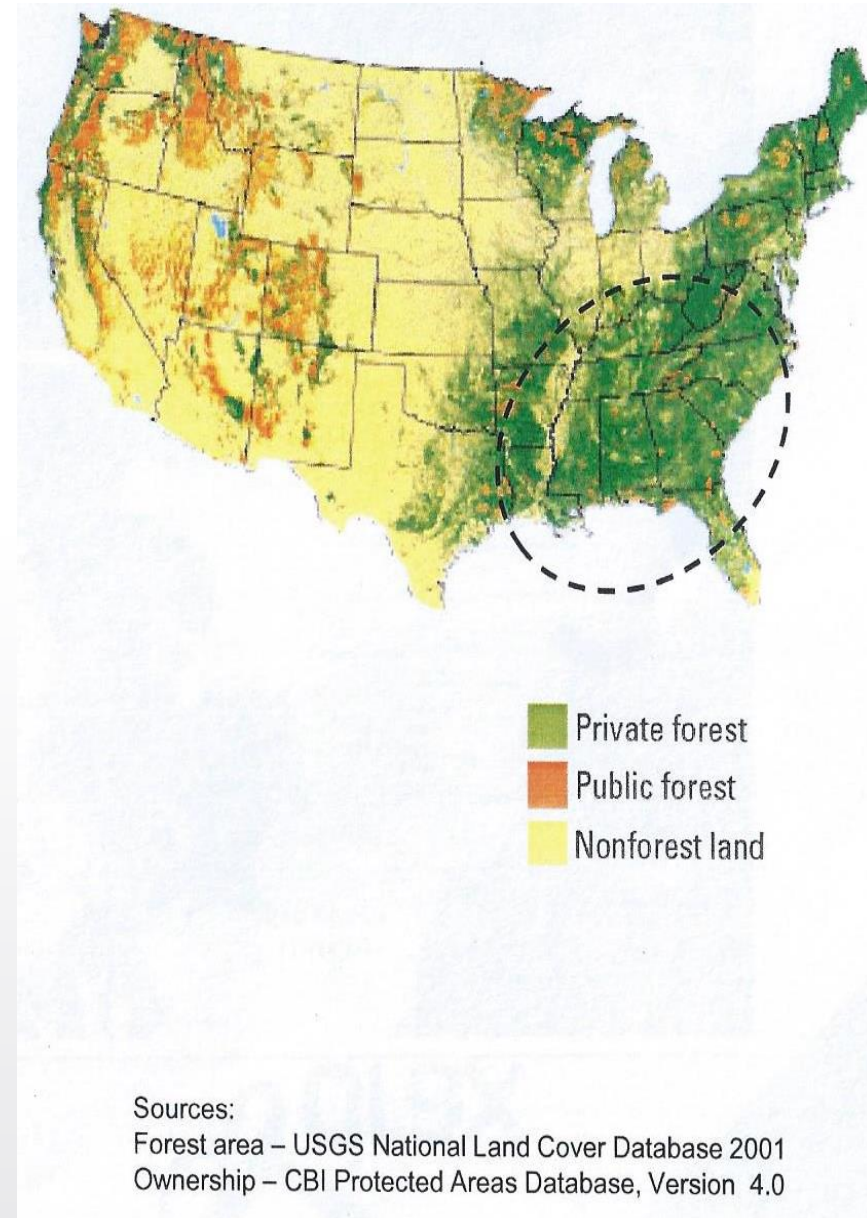
**Forest residuals are under used**

**On average 50% more growth than removals**

**87% of Forests are privately owned**

**Net volume of trees per acre has increased**

**Historic CRP program benefits**



# USFS Forest Inventory & Analysis (FIA)

- Continuous growth and yield plots started with the McSweeney–McNary Act of 1928
- Today comprises of 4.5 million remote sensing plots, 125,000 permanent field plots, over 100 characteristics measured on each plot, 1.5 million trees sampled
  - Volume/Diameter/Height/Vigor/Species/Condition/Growth/Mortality/etc.
- Congress mandated a national assessment of the nations renewable resources through the Forest and Rangeland Resources Planning Act of 1974. (RPA)
- According to the USFS, America's low point for forested land was around 735 million acres in 1920. By the year 2000, that number was up to 750 million and has remained near those same levels for decades.





## Loblolly Pine Resource





Loblolly Pine is an early successional tree species









## Mass Controlled Pollination (MCP) Example

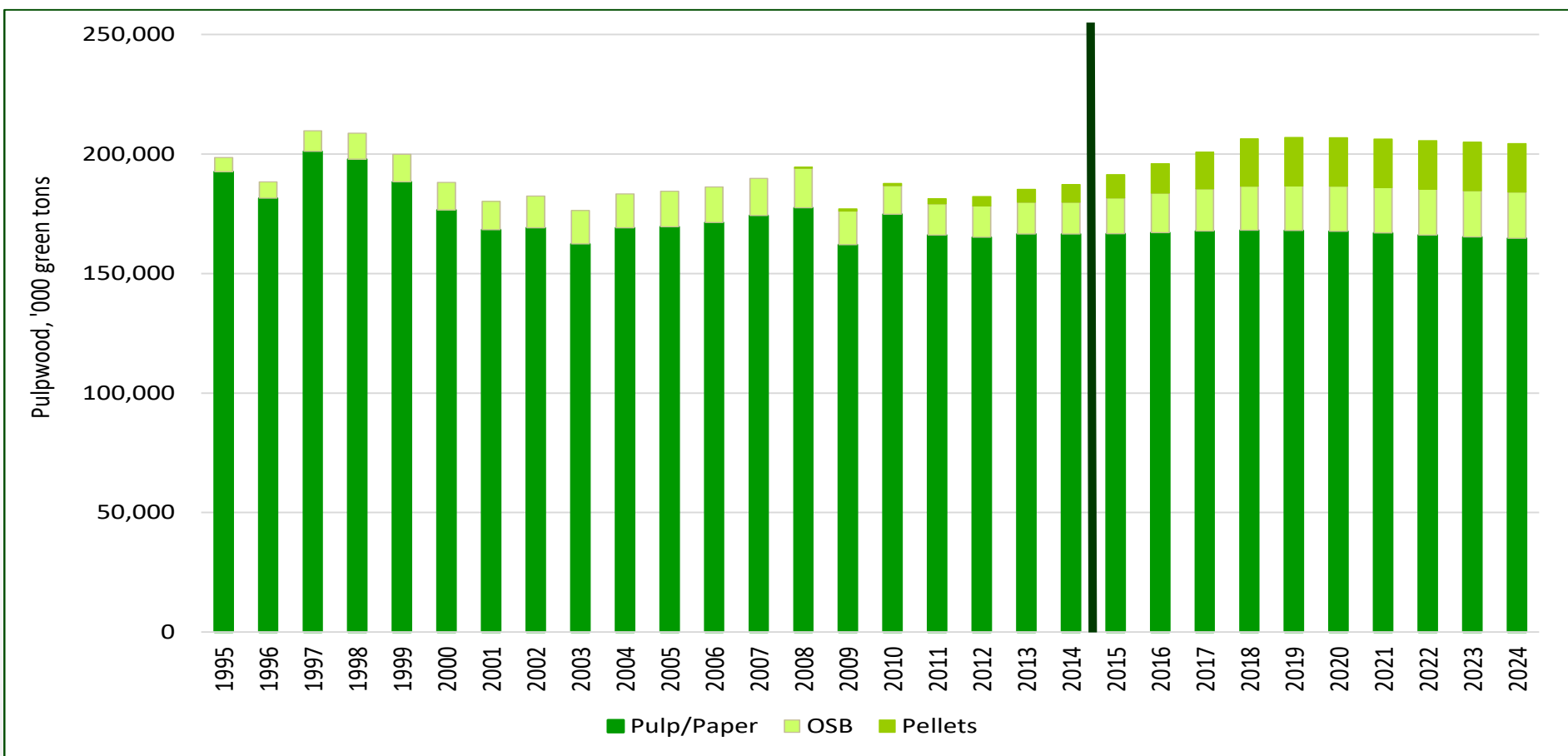








# Pulpwood and Chip Demand in the South: Hardwood and Softwood



Source: Forisk Consulting



THE WALL STREET JOURNAL  
Home World U.S. Politics Economy Business Tech Markets Op  
**International Paper to Close Alabama Mill**  
Weakening Demand in Digital World Displaces 1,100 Employees

By Bob Tita

Updated Sept. 17, 2013 9:37 am ET

International Paper Co. **IP 1.06%** plans to close its biggest paper mill, displacing workers and citing shrinking demand for paper in an increasingly digital world.

For workers at the Courtland, Ala., plant, the timing of the announcement could be better: It comes a day after the company, whose sales and profit have been grossly boosted its dividend 17% and said it would buy back \$1.5 billion of stock.

With more consumers emailing, paying bills online and storing files electronically than printing out reams of records, the market for copy paper and envelopes has been falling for the past decade.



**LP shuts Athens, Georgia, and Silsbee OSB mills**

15 March 2010

Print Email

Louisiana-Pacific (LP) has permanently closed its OSB mills in Athens, Georgia, and Silsbee, Texas, another 725 million ft2 of production capacity off the North American market.

During a recent conference call related to LP's Q4 and full-year 2009 financial performance, the company said, "We made the decision to go ahead this quarter and put the permanently closed OSB mills which had been in the indefinitely shut category - that is Athens, Georgia, and Silsbee, Texas."

"This is about 725 million square feet of rated capacity that moves into the permanently closed category," the company said.

Athens had an annual capacity of 375 million ft2/year and Silsbee had 350 million ft2/year. Both mills had been indefinitely curtailed since August 22, 2007, and the Athens mill had not been operating since then.

**International Paper closes pulp mill in Louisiana**

RP news wires, Noria Corporation

**Georgia-Pacific will close Jarratt plant Nov. 1, lay off 79 employees**

Production at fiberboard factory will be moved to facility near Houston

By PETER BACQUÉ Richmond Times-Dispatch Oct 10, 2013

The Jarratt facility

had been

operating

f t e b

Georgia-Pacific will close its Jarratt fiberboard plant in Southside Virginia on Nov. 1 and lay off all 79 employees, the company said.

The Atlanta-based company notified employees and local officials of the coming closure of its Greenville County facility Wednesday, a move that comes as the company looks for ways to improve its global economic outlook for the foreseeable future, we



**Franklin paper mill to close; 1,100 to lose jobs**

By PHIL WALZER

THE VIRGINIAN-PILOT | OCT 22, 2009 | 12:00 AM

International Paper Co. said Thursday that it will close its paper mill outside Franklin next spring, laying off 1,100 workers.

The layoffs will begin Nov. 7, with the shutdown of one of the plant's four machines, and continue through the spring, said Jeannine Siembida, the plant manager.

"The biggest reason is the global recession that we've got going on," Siembida said. "We've realized a good portion of the demand is not going to come back, so we've had to make this permanent decision."

**Pulp & paper industry sees more than 60 mill closures in past year**

More than 60 pulp and paper mills were closed and 33 idled production from 2013-2014

BOSTON, MA, Jan. 22, 2015 (Press Release) - These and other important changes in global pulp and paper mill production were published recently in the Lockwood-Post Directory. The directory is produced by RISI, the leading information provider for the global forest products industry.

"Understanding mill operation globally is critical for those competing for business in the industry. The Lockwood-Post Directory provides readers to track critical changes that are taking place in the world's most influential mills," said Jon Rager, Senior Vice President, Analytics and head of the Mill Intelligence Services division.

AGRICULTURE MANUFACTURING TALK POLITICS

**Georgia-Pacific to lay off 655 workers by closing Crossett, Hope facilities**

by Roby Brock (robby@talkbusiness.net) | June 4, 2019 10:50 am | 23,171 views

Tags: Georgia-Pacific

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**Verso announces closing of Luke mill, loss of 675 jobs**

Cumberland Times-News Apr 30, 2019



**News alert: Georgia Pacific to lay off 700 at Port Hudson facility**

By Stephanie Riegel - January 10, 2019

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# Pellet Feedstocks

## Forest harvesting

### Sawlogs

Highest value, must be large and straight



### Pulpwood/Thinnings

Low value, can be random size and shape



### Residues

No value, waste product if no market, can be expensive to process



## Mill residuals

### Wood Chips

Highest value residuals, often used in pulp industry



### Sawdust

Lower value, often used on site in kilns or biomass boilers



### Dry Shavings

Requires minimal processing, readily adaptable for pellets





# Wood BioEnergy Example

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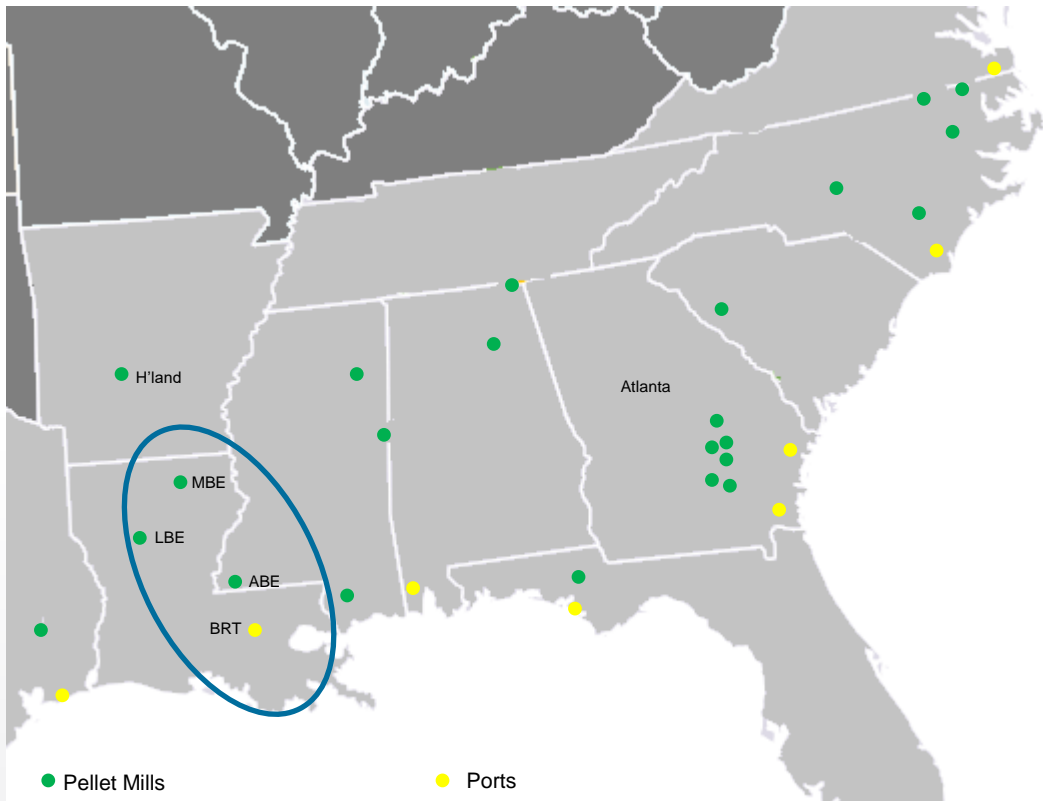
## Benefits of forest-based feedstock

- Plentiful, renewable resource
- Mature industry supply chains
- Requires minimal irrigation, fertilization
- Ideal combustion characteristics

## Benefits of pelletizing

- Efficient, cost-effective bulk transport
- Low moisture content = >BTU value
- Adaptable for use at coal-fired facilities
- Stringent specs = reliable performance

# Pellet Industry Concentrated in U.S. South



## 23 Industrial Pellet Mills 8 Ports

Enviva	3.2M*
DBI	1.5M
Georgia Biomass	0.75M
Highland (via BRT)	0.6M
Fram	0.6M
Colombo	0.5M
Texas Pellets	0.5M
Westervelt	0.25M
Others	0.2M

Total (potential nameplate) 8.1M

(\*MT)



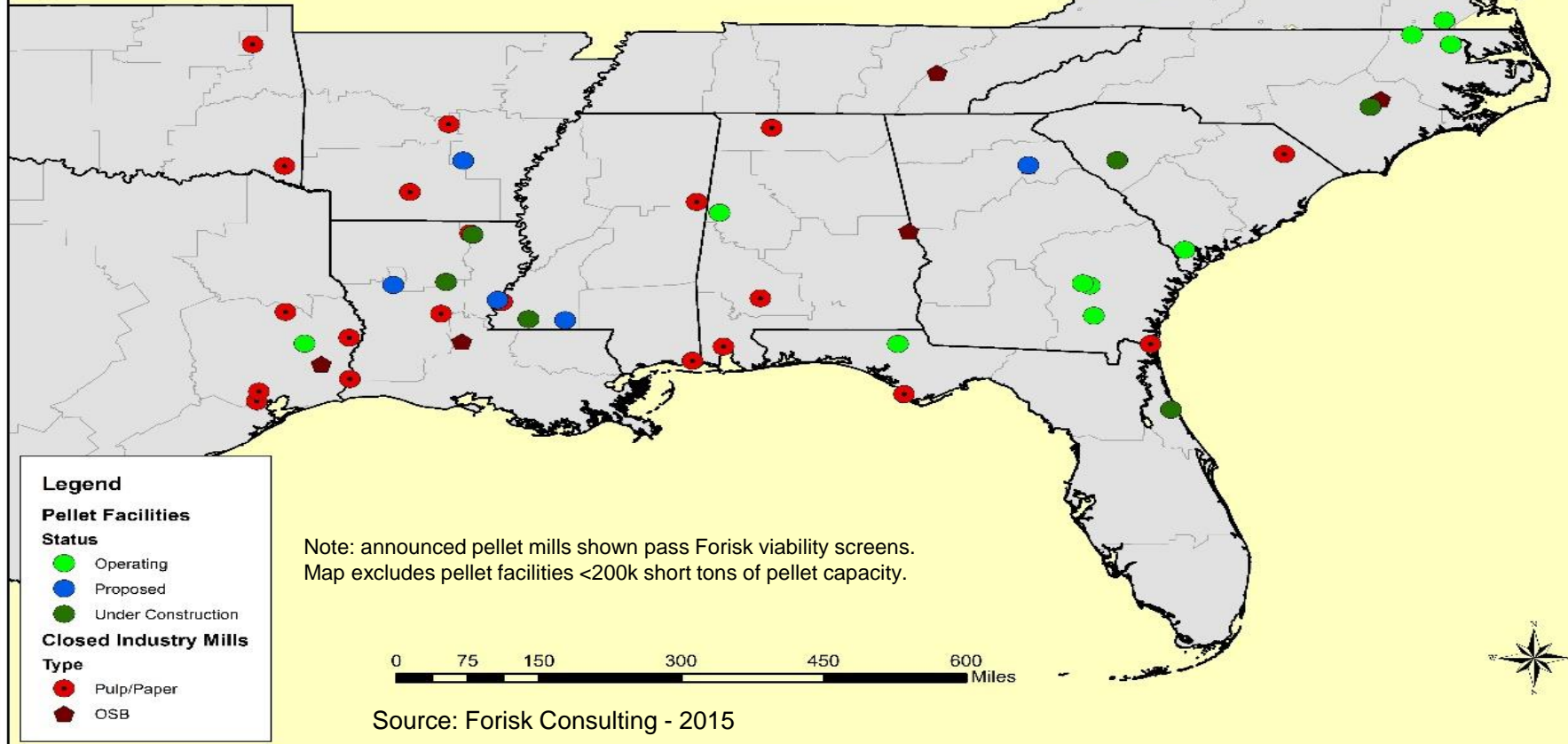
# Closed Industry Mills and Operating and Announced Pellet Mill Locations



Demand for roundwood and chips, green tons

Closed Pulp/Paper and OSB Demand	Operating and Announced Pellet Facility Demand
28,084,918	23,837,006

Note: demand is reported for roundwood and chips (including residuals). Pellet totals exclude facilities <200k short tons of pellet capacity (which represent an additional 2.0 million tons of wood).



# Drax Biomass Example



## Morehouse BioEnergy

Bastrop, LA  
525kt pa



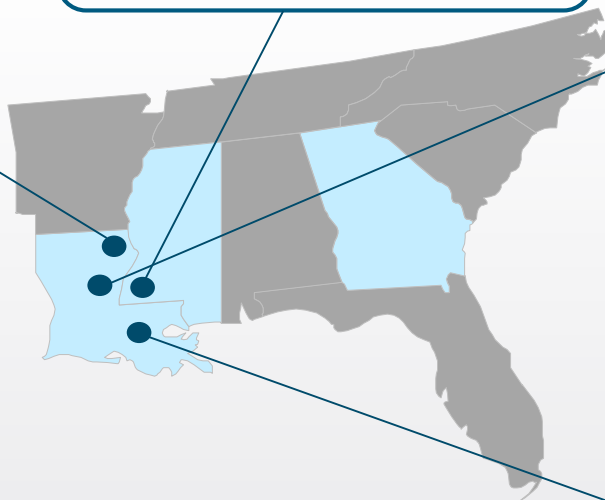
## Amite BioEnergy

Gloster, MS  
525kt pa



## LaSalle BioEnergy

LaSalle, LA  
450kt pa

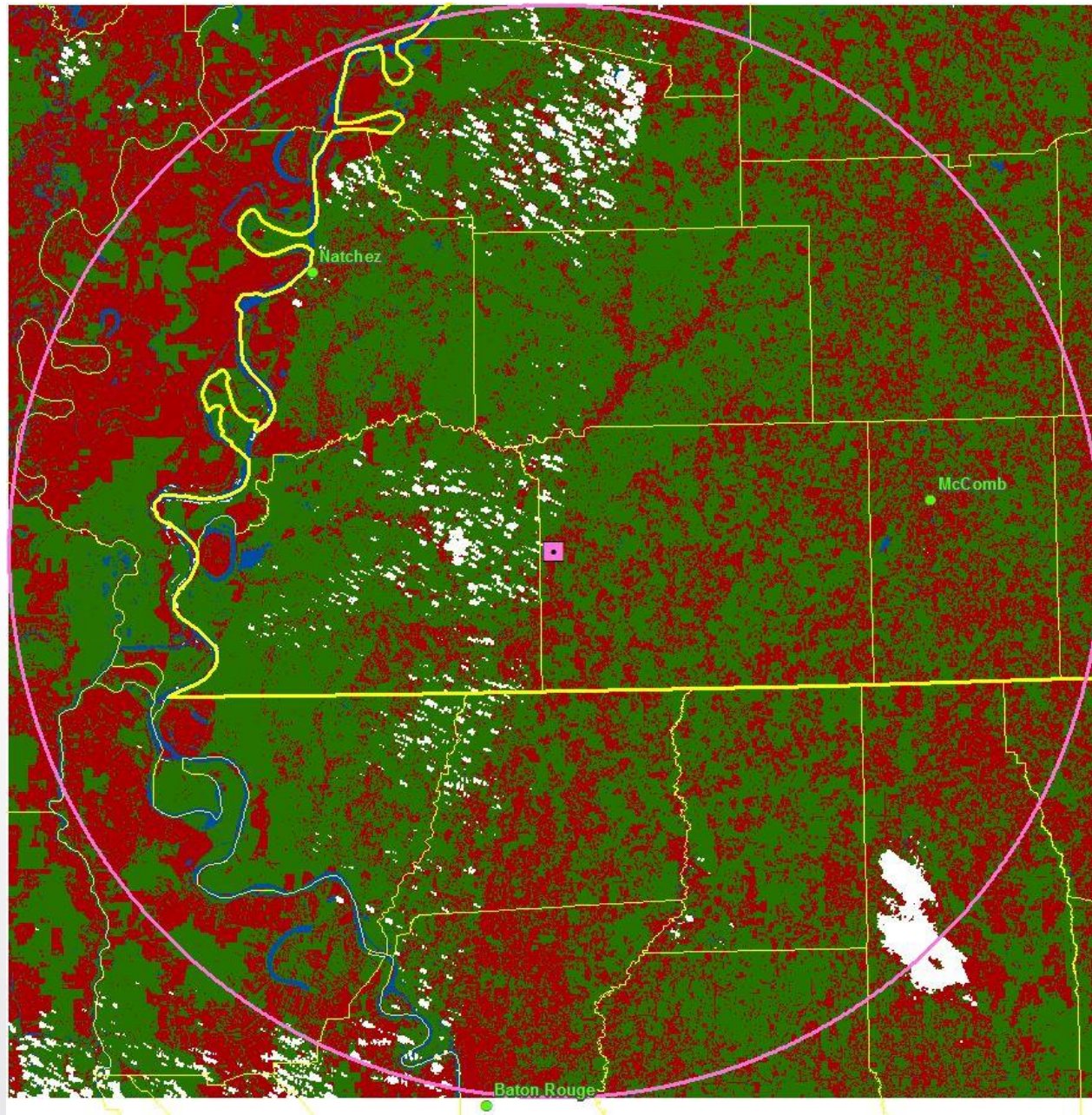


## Baton Rouge Transit

Port Allen, LA  
2Mt pa

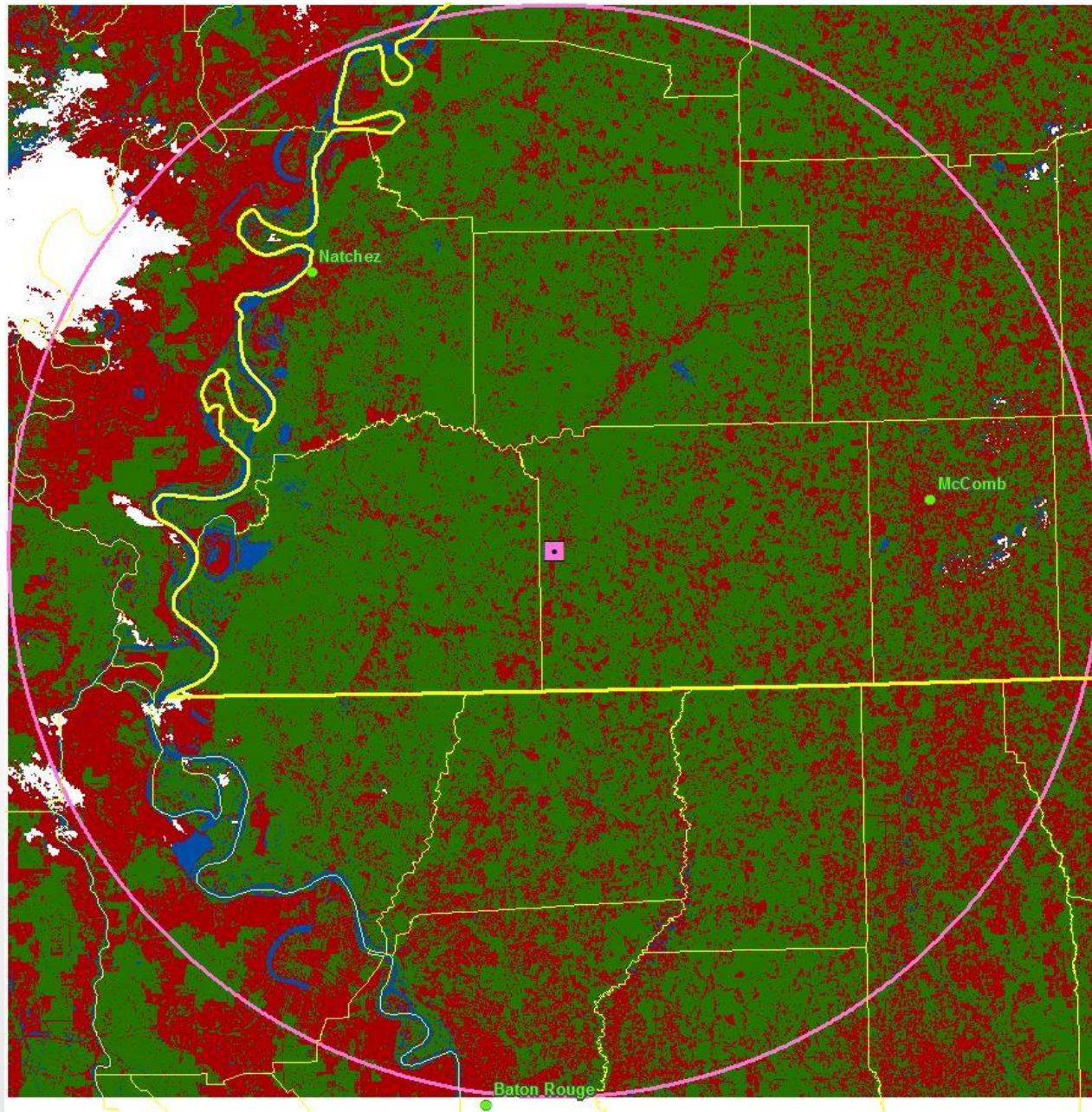


# Classified Landsat Image for ABE 1985





# Classified Landsat Image for ABE 2015





## **Acres by Class for ABE 1985**

**Forested – 3,738,314 ac**

**NonForest – 2,317,744 ac**

**Water – 152,132 ac**

## **Acres by Class for ABE 2015**

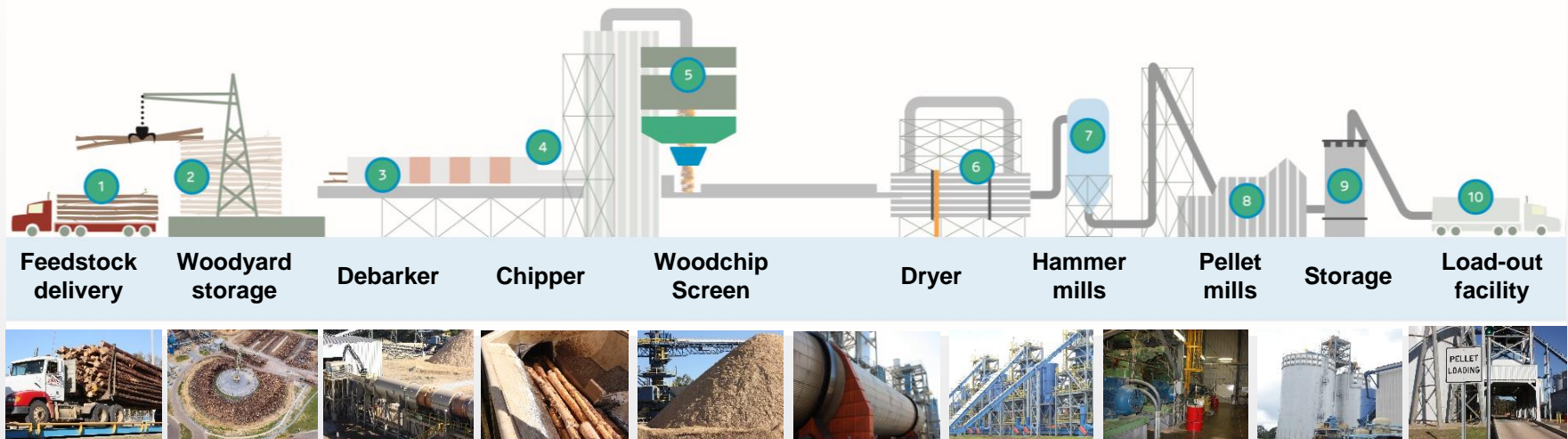
**Forested – 3,921,532 ac**

**NonForest – 2,075,351 ac**

**Water – 207,841 ac**



# Wood BioEnergy Manufacturing Process





# Export Storage Domes at the Port of Baton Rouge





# U.S. Bio-Energy Examples

Proctor and Gamble in Albany, GA has a 50-megawatt biomass-fueled steam and power plant.



# U.S. Bio-Energy Examples

Graphic Packaging paperboard mill in Macon, Georgia converted to 100% biomass energy.

\$80 million invested in high-efficiency biomass boiler and 40-megawatt turbine generator

CO<sub>2</sub>(e) emissions reduced by 200,000 tons per year

Excess electricity is placed on grid







“In the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual sustained yield of timber, fiber, or ***energy*** from the forest, will generate the largest sustained mitigation benefit.”

- IPCC Special Report on Land and Climate (Ch 4, 4.8.5, page 66)