



2013 Carbon Sequestration of Georgia Timberland

According to the most recent Forest Inventory & Analysis data, provided by the U.S. Forest Service, almost 1.6 billion metric tons of CO₂ was sequestered in Georgia timberland as of 2013, across 24.2 million acres (Tables 1 & 2). The total includes federal, state/local, and private property, and it accounts for carbon in above and belowground live and dead biomass, above and belowground understory vegetation, coarse woody debris, soil, and leaf litter.

Of the total, more than 1.4 billion metric tons, or approximately 91%, is sequestered on private land (Table 1). This includes over 22 million privately owned acres (Table 2). Broken down by stand origin, planted and natural stands represent 31% and 69% of total carbon sequestration, respectively. This yields an average of 64.4 metric tons per acre for all of Georgia timberland (Table 3). Considering the substantial supply private land provides to Georgia's forest products industry, the remainder of this paper focuses only on private timberland.

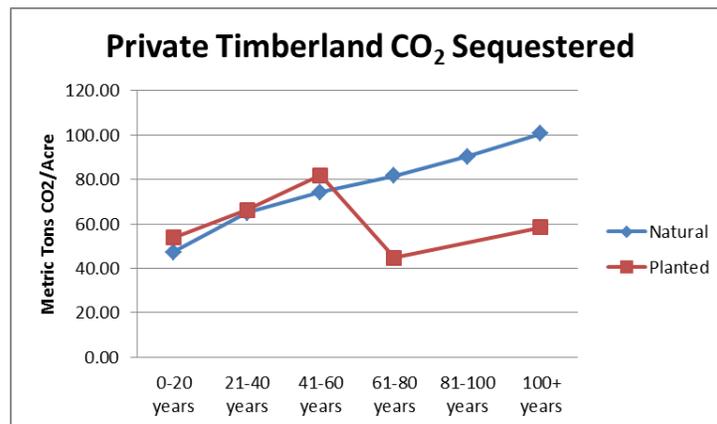


Figure 1: Per acre carbon sequestered by age class on private land.

Fig. 1 shows that 0-60 year-old, planted stands sequester more carbon on a per acre basis than natural stands. It also indicates that the majority of planted stands over the age of 60 have been thinned heavily, reducing sequestration to approximately 45 metric tons per acre for the age class of 61-80 years. Note that Fig. 1 and Table 4 show that there was no FIA data collected for the age class, 81-100 years, for the 2013 survey year on planted private land. In survey years where data is observed, it would likely range from 40 to 60 metric tons per acre, following a similar trend found in the 61-80 and 100+ year age classes.

Furthermore, 97% of carbon sequestered in planted stands is under the age of 40 (Table 5). Natural stands show a continued increase through 100 years of age due to the longer rotations required for hardwoods. However, according to a publication by the U.S. Forest Service, despite the increased rotation length of natural stands, shorter rotations result in a greater amount of

total carbon converted to wood products over a 100-year period and should be considered an important avenue of sequestration (Johnsen et al 2001). Under the age of 40 and 60, total carbon sequestered is 59% and 78%, respectively (Fig. 2). Therefore, reforestation of properly managed timber on younger rotations will be critical in maximizing Georgia’s carbon sequestration. For further information on planted and natural timberland, including sequestration and acreage by age classes for all ownership classes, please refer to Tables 5 – 8.

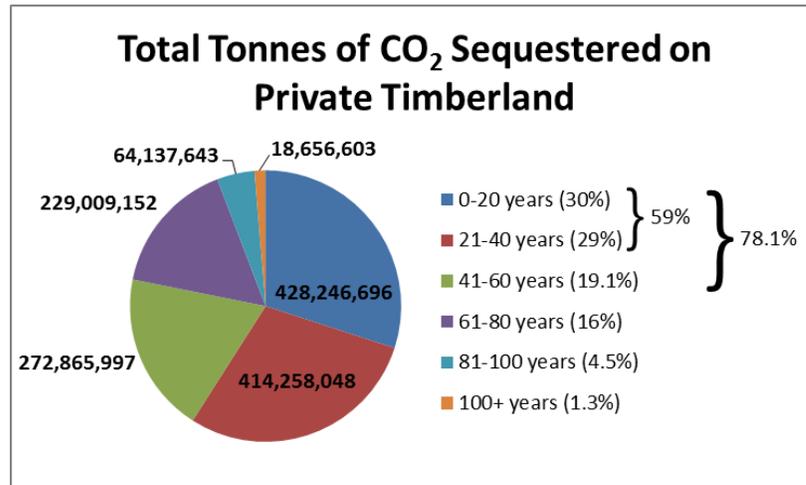


Figure 2: Metric tons of carbon sequestered by age class on private timberland

Some conservation groups question the sustainability of Georgia’s forests to supply an increasing demand for wood pellets. However, the majority of timberland is managed for higher-valued products (such as sawtimber, poles, etc.), which continue to sequester carbon as finished products, while trees may be replanted to provide additional sequestration in place of the harvested timber. The volume ratio of growing stock (sawtimber-potential trees 5+ inches in diameter) to total live trees, for all private timberland is 86%. Planted and natural stands are 94% and 83% growing stock, respectively (Table 9). Therefore, roundwood sold to pellet mills will only include trees of inferior quality or size that would not otherwise have the capability of producing sawtimber. In most cases, utilized biomass is timed at the maximum volume the stand can reach without mortality occurring due to self-thinning, which maximizes growth for higher-valued products that will be utilized in future harvesting operations.

Finally, the biomass market should help encourage timberland owners to replant, taking advantage of stronger markets. Reducing the available markets will only pressure land conversion for commercial development or other non-forest use as Georgia’s population continues to rise. With a continuous demand for energy, utilizing Georgia’s renewable resources through sustainable forest management will maximize carbon sequestration without compromising the economical or ecological benefits of timberland.

Sources:

Johnsen, Kurt, et al. “Meeting Global Policy Commitments: Carbon Sequestration and Southern Pine Forests.” (2001). http://www.srs.fs.usda.gov/pubs/ja/ja_johnsen007.pdf. 15 June 2015.

U.S. Forest Service EVALIDator Version 1.6.0.02 - <http://apps.fs.fed.us/Evalidator/evalidator.jsp>

1 metric ton (tonne) = 2204.62 pounds

Total – Natural and Planted Timberland

Table 1: Total Metric Tons of CO₂ Sequestered on Timberland, Georgia, 2013

Ownership group	Stand age 20 yr classes (0 to 100+)						
	Total	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Total	1,571,308,000	443,006,627	444,498,472	303,105,862	269,033,075	87,042,858	24,621,105
National Forest	46,357,980	1,359,519	8,970,835	4,164,645	13,671,556	13,137,707	5,053,719
Other federal	43,323,654	2,152,768	6,787,482	13,808,459	14,790,588	5,784,362	-
State and local	54,452,224	11,247,646	14,482,107	12,266,762	11,561,778	3,983,146	910,784
Private	1,427,174,140	428,246,696	414,258,048	272,865,997	229,009,152	64,137,643	18,656,603

Table 2: Total Timberland Acres, Georgia, 2013

Ownership group	Stand age 20 yr classes (0 to 100+)						
	Total	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Total	24,164,204	8,756,024	6,767,851	4,054,071	3,330,345	986,735	269,178
National Forest	655,113	32,284	131,178	63,058	191,197	170,541	66,855
Other federal	562,666	48,321	106,473	170,081	174,206	63,586	-
State and local	788,426	207,347	204,238	163,361	156,661	42,559	14,259
Private	22,157,999	8,468,071	6,325,962	3,657,572	2,808,280	710,049	188,064

Table 3: Private Timberland Natural and Planted Stand Summary, Georgia, 2013

	Planted	Natural	Total
Metric Tons CO₂	440,478,118	986,696,022	1,427,174,140
Acres	7,448,954	14,709,044	22,157,999
Metric tons/acre	59.1	67.1	64.4
Percentage	31%	69%	100%

Table 4: Metric Tons per Acre on Private Timberland, Georgia, 2013

Private	Average	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Natural	67.1	47.2	64.9	74.3	81.6	90.3	100.5
Planted	59.1	53.7	66.2	81.8	44.7	-	58.5

Planted Timberland

Table 5: Planted Stand Metric Tons CO₂ Sequestered on Timberland, Georgia 2013

Ownership group	Stand age 20 yr classes (0 to 100+)						
	Total	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Total	456,145,011	241,085,352	201,825,957	12,369,682	139,269	378,572	346,178
National Forest	1,729,486	182,408	1,547,077	-	-	-	-
Other federal	2,949,600	727,043	802,201	1,041,784	-	378,572	-
State and local	10,987,806	5,142,852	5,704,679	140,277	-	-	-
Private	440,478,118	235,033,048	193,772,002	11,187,624	139,269	-	346,178

Table 6: Planted Stand Acreage, Georgia, 2013

Ownership group	Stand age 20 yr classes (0 to 100+)						
	Total	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Total	7,691,284	4,481,307	3,040,645	154,431	3,114	5,867	5,919
National Forest	28,692	5,867	22,825	-	-	-	-
Other federal	48,085	16,135	10,306	15,776	-	5,867	-
State and local	165,552	82,842	80,802	1,908	-	-	-
Private	7,448,954	4,376,463	2,926,712	136,747	3,114	-	5,919

Natural Timberland

Table 7: Natural Stand Metric Tons of CO₂ Sequestered on Timberland, Georgia, 2013

Ownership group	Stand age 20 yr classes (0 to 100+)						
	Total	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Total	1,115,162,989	201,921,275	242,672,513	290,736,178	268,893,805	86,664,286	24,274,929
National Forest	44,628,495	1,177,111	7,423,760	4,164,645	13,671,556	13,137,707	5,053,719
Other federal	40,374,055	1,425,724	5,985,281	12,766,673	14,790,588	5,405,788	-
State and local	43,464,417	6,104,793	8,777,428	12,126,487	11,561,778	3,983,146	910,784
Private	986,696,022	193,213,648	220,486,046	261,678,373	228,869,885	64,137,643	18,310,427

Table 8: Natural Stand Acres, Georgia 2013

Ownership group	Stand age 20 yr classes (0 to 100+)						
	Total	0-20 years	21-40 years	41-60 years	61-80 years	81-100 years	100+ years
Total	16,472,920	4,274,717	3,727,206	3,899,640	3,327,231	980,867	263,260
National Forest	626,421	26,417	108,354	63,058	191,197	170,541	66,855
Other federal	514,581	32,186	96,166	154,305	174,206	57,718	-
State and local	622,874	124,506	123,436	161,452	156,661	42,559	14,259
Private	14,709,044	4,091,608	3,399,250	3,520,825	2,805,167	710,049	182,146

Table 9: Private Timberland Growing Stock & Total Live Volume, Georgia, 2013

	Growing Stock	Total Live	% Growing Stock
Natural	22,996,457,818	27,753,959,656	83%
Planted	8,939,647,744	9,461,834,956	94%
Total	31,936,105,562	37,215,794,612	86%

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